

Demographic Transition, Demographic Dividend, and Lewis Turning Point in China

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Abstract: The disagreements on changed stages of demographic transition and the role of a demographic dividend in a dual economy development process often lead to wide debates among scholars about China's development stages. This paper tries to reveal the nexus between demographic transition and dual economy development: the common starting point, close related processes, and identical characteristics of stages. Based on the empirical evidence of population dynamics, the paper supports the judgment of diminishing demographic dividends and an imminent Lewis turning point in China. It also argues that further economic growth and thus faster entry into a high-income economy is the key and only way to close the "aging before affluence" gap. Accordingly, the paper concludes by proposing measures to exploit the potential of the first demographic dividend, creating conditions for a second demographic dividend, and tapping new sources of economic growth.

Key words: Demographic transition; Demographic Dividend; Lewis turning point; Aging before affluence

JEL Classification: J11, O53

1. Introduction

One of the hot topics that inspire debates among scholars, policy researchers, and even policy-makers is whether Chinese economic growth is losing its source and momentum from demographic dividends. Another related topic is whether China reaches its Lewis turning

point – namely, labor supply is no longer unlimited. In a research paper, Cai and Wang (2005) estimates that the decline in the population dependence ratio, as a proxy for demographic dividend, contributed 26.8 percent to per capita GDP growth during 1982 to 2000, and warns that such a demographic dividend will disappear after 2013 when dependence ratio stops decreasing and begins increasing. By examining changes in population age structure, labor demand trends, widespread labor shortages, wage rises of ordinary workers, Cai (2008a, 2008b) asserts that the Lewis turning point has indeed come, and points out its policy implications in terms of growth pattern transformation, income distribution trends, labor market institutional construction and human capital accumulation.

While some researchers and even some policy documents support and cite the conclusion about the arrival of the Lewis turning point, others strongly disagree. In previous replies, Cai (2008a) tried to provide a wide range of evidence to defend his arguments. It turns out that people come out with conflicting opinions about economic reality, and explain the same phenomenon in different ways. Many still firmly hold to the conventional wisdom that there is a massive and increasing working age population and thus endless surplus labor force in rural areas, and that this is an unchangeable characteristic of China. Propositions which assert the possibility of labor shortage or disappearance of the surplus labor force in agriculture – namely that the Lewis turning point is arriving - are not widely agreed¹. Specifically, all skeptical and critical comments on the judgment about an ongoing Lewis turning point, which results from a static understanding of population and labor force in China, are generally puzzled by the Chinese statistics. In what follows, I unveil some aspects of such statistical puzzles.

First, given that the official survey on utilization of agricultural workforce is unable to reflect the fast changing reality of agricultural production, some scholars are unaware of the changed situation, while others who have tried to understand the statistics are actually trapped

¹ This existing paper does not intend to discuss the divarication that is caused by different definitions of Lewis turning point. According to Lewis (1972) and Ranis and Fei (1961), Lewis turning point can be referred to as the period of time at which expansion of labor demand exceeds that of labor supply and, as a result, wage rate of ordinary workers starts to rise, while wage of agricultural sector is not yet determined by its marginal productivity of labor and the difference of marginal productivity of labor between agricultural and non-agricultural sectors remains. And the time when the wage rates in agricultural and non-agricultural sectors are both determined by their marginal productivity of labor and the gap in productivities disappears can be called commercial point. Only at this time, dual economy ends.

in “the tyranny of numbers” as was Young (1994) when he tried to challenge the “East Asian miracle”. Either case makes any endeavor of econometric analysis hostage to the data. The point is that economic reform in China has been too fast for the statistical system to catch up (Ravallion and Chen, 1999). One of the many examples that cause confusion concerns the accurate numbers of agricultural workforce actually used. In 2008, the reported total labor force engaged in agriculture was 307 million, accounting for 39.6 percent of the country’s total employment, and the figure provided by 2008 Agricultural Census was even higher. However, the actual input of labor in agricultural production, calculated based on agricultural costs survey data, turns out to be much less than any published aggregated figures (Cai and Wang, 2008). Taking into consideration the changing trend of working age population in rural area, the updated situation of labor migration from rural to urban sectors, and the extent to which agriculture is mechanised, one must conclude that the actually used workforce in agricultural production is much less than what official statistical publications declare. Therefore, the declaration that there is large amount of surplus labor to be shifted from agriculture (e.g. Lau, 2010a) and the econometric estimation of marginal productivity of labor in agriculture (e.g. Minami and Ma, 2009), which are both based on the aggregated dataset, tend to overestimate the degree of labor surplus in agriculture and conclude that the Lewis turning point has not come to China.

Second, scholars have difficulties in interpreting statistics on labor market and rural and urban employment, and thus they often elicit conclusions that deviate from reality. As the result of sectoral changes and increasing diversification of ownership, especially after the labor market shock in the late 1990s, multifaceted sectors have appeared to absorb labor into urban areas, contrary to the pre-reform period when state and collective sectors dominated employment absorption. Among those sectors of employment, large scale informal employment, as the byproduct of reemployment of the laid-off and of diversity of employment, is new to China. Meanwhile, massive numbers of rural laborers have transformed their jobs from agricultural to non-agricultural sectors, amounting to 240 million, of which 145 million migrated into cities. In routine statistics, neither informal employment of urban residents nor employment of migrant workers in urban sectors has been authoritatively reported, except for estimated figures of migrant workers based on sampling

surveys and aggregated estimate of informally employed urban residents under certain assumptions (Cai, 2004). We can view the difference between the number of total employment based on the unit reporting system and the number of employment based on the household survey as a proxy for urban informal employment, which amounts to 95.1 million and accounts for 31.5 percent of total urban employment in 2008. It is however helpless if one wants to do any statistical analysis on structural characteristics of the total employment, because of lack of disaggregated data on it. Moreover, the statistical authority has so far not promulgated an alternative surveyed unemployment rate data series to the discredited registered unemployment rate, and that leads scholars to do various guesstimates on the unemployment rate. Based on incomplete employment data and unfounded guesstimates, Chinese and international scholars often educed conclusions such as zero growth of employment and a high and increasing unemployment rate (Ru et al., 2008, p. 22; Rawski, 2001; Solinger, 2001) and doubt the authenticity of the widespread labor shortage.

Third, there is no officially published systematic data and up to date information on the status of demographic change and population dynamics. While various rounds of national population censuses provide information about population changes, due to lack of consensus on some important parameters of China's demographics such as the actual total fertility rate (TFR) ¹, no authoritative projections of population change, including predictions of magnitude and the age structure of the population, have been periodically publicized. The public and academia therefore do not have updated information about t population developments trends and many conceive that the peak of population growth will be reached in or after 2040 and then the total population in China will as many as 1.6 billion (e.g. Lau, 2010b). More specifically, most scholars ignore the fact that the growth of China's working age population has been slowing and thus the demographic foundation of unlimited labor supply has been shrinking, and therefore they are unwilling to accept the assertion of an ongoing Lewis turning point associated with a diminishing demographic dividend.

¹ The 5th National Population Census conducted in 2000 shows that China's TFR was 1.32, which is even lower than policy allowable level of 1.51. Many doubt such a result (e.g. Yu, 2002). Since then the debates on what is the actual TFR of China have existed among scholars and policy researchers. Generally speaking, the government departments responsible for implementing the population control policy tend to believe a higher TFR, whereas scholars believe a lower TFR. In spite of the disagreement, the estimates mostly fall in the range of 1.6 to 1.8, which are all significantly lower than the replacement level of 2.1.

It is obvious that an undistorted understanding of status and trends of demographic transition will help scholars and policy researchers better understand the state of labor market and will serve as a foundation for policy decisions on how China can sustain its economic growth. The following sections of the paper argue that demographic transition and dual economy development have a common starting point, related and similar characteristics of development stages, as well as overlapping processes to a large extent, so that the demographic window of opportunity in which a demographic dividend is obtained is one of the stages of dual economy development. Accordingly, the theoretical and empirical work and reasoning about a diminishing demographic dividend and incoming Lewis turning point kill two birds with one stone. The rest of the paper is organized as follows. Section 2 reveals a stylized fact about relationship between demographic transition and dual economy development based on international experiences. Section 3 depicts the China's process of demographic transition and its impact on economic growth. Section 4 tries to answer the question of how the "aging before affluence" gap can be narrowed. Section 5 concludes by drawing policy implications of the issues discussed in the paper.

2. Stages of Demographic Transition and Development of Dual Economy

The theory of dual economy coined by Lewis (1954) divides a typical developing economy into two sectors: the agricultural and modern sectors. Because labor force is superfluous relative to capital and land in agriculture, its marginal productivity in the sector is very low, even as low as zero or below. As the modern sector expands surplus labor in agriculture is transferred to modern sector without substantial rise of wages, and the whole process is typically called the development of dual economy. Such a process continues until it reaches a point at which the growth of labor demand succeeds growth of labor supply and further labor transfer requires increase in unskilled workers' wage rate. That point is generally called Lewis turning point. In spite of its ups and downs in economics history (Ranis, 2004), Lewisian theory of dual economy has always remained as an important theoretical model of

development economics.

Even before Lewis's prominent paper first appeared, the mature form of demographic transition theory had been published already¹. Corresponding to pre- and post-industrialization periods, demographic transition is categorized into three stages, which are respectively characterized by (1) high birth rate, high death rate and low natural growth rate of population, (2) high birth rate, low death rate and high natural growth rate of population, and (3) low birth rate, low death rate and low natural growth rate of population. Although we cannot judge whether Lewis noticed those literatures in demography, there is no lack of demographic assumptions related to the theory of demographic transition in his description of development of dual economy. While defining unlimited supply of labor, the key concept of the theory of dual economy, he explains: "unlimited supply of labor may be said to exist in those countries where population is so large relatively to capital and natural resources, that there are large sectors of the economy where the marginal productivity of labor is negligible, zero, or even negative." The connotative assumption of this statement is that a typical dual economy characterized by unlimited supply of labor is at the second stage of demographic transition – that is, natural growth rate of population is high as the result of declined mortality and inertial high birth rate. Since agriculture is primary sector in the sectoral chain, it is the first place where the abundant population and surplus labor force roost.

The key of comprehending the logical and empirical relationship between demographic transition and development of dual economy is to explore how demographic dividend is engendered and obtained. In early literature of demography and economics, the population-development nexus was discussed by focusing on the relationship between economic growth rate and population growth rate or population quantum, while the discussion on demographic transition was mainly about demographic contents such as population quantity, birth rate, and death rate, but not closely related to economic growth. Besides, mainstream of growth theory, while incorporating population into endogenous growth, usually neglects characteristics of demographic transition of dual economy. After long neglect

¹ Whereas Thompson (1929) first identified the three stages of demographic transition and another scholar added two more later stages, they were both not considered as the farther of theory of demographic transition, because they did not provide standard theoretical explanation on decline of fertility. The honor was later awarded to Notestein (1945). Please see Caldwell (1976) for a brief history of this field.

of economic development and structural characteristics of population, particularly the relation between population age structure and labor supply, as all developed countries and many newly industrialized economies successively completed their demographic transition process, demographers became conscious of population aging and its consequences. Economists farther unveil the change in working age population going with fertility decline and its effect on sources of economic growth (Williamson, 1997). That is, in the interval between a sooner decline of death rate and later decline of birth rate, natural growth rate of population is usually at its fast rise, youth dependence ratio is also increasing. After a certain period of time, as fertility decreases and the baby boomers grow up, the proportion of working age population enhances accordingly. The further decline in fertility as a result of economic and social developments causes slowdown of natural growth rate of population, and the structural consequence of such a dynamics is population aging. In short, following a reversed U shape pattern – namely, natural growth rate of population first increases and then declines after a turning point, with an interval of about one generation, growth rate of working age population presents a similar pattern of changes.

During the period in which population age structure is most productive, adequate supply of labor and high savings rate afford an extra source of economic growth and thus form demographic dividend. Consequently, once demographic transition exceeds this stage – namely, population age structure becomes less and less productive, because of the rapid aging, such conventionally defined demographic dividend gradually disappears. Since the stages in demographic transition can be sufficiently characterized by changes in total fertility rate (TFR), one can theoretically expect the following relation between demographic transition and economic growth (Figure 1): the stage of high TFR coincides with steady state of low growth rate; as TFR falls and as a result, a more productive population age structure comes into being, demographic dividend promotes economic growth to a higher rate; when TFR further drops to low level and population ages, economic growth rate again shrinks to low steady state. Correspondingly, at a certain stage of demographic transition when TFR declines rapidly and population age structure becomes more and more productive, there forms a demographic window of opportunity.

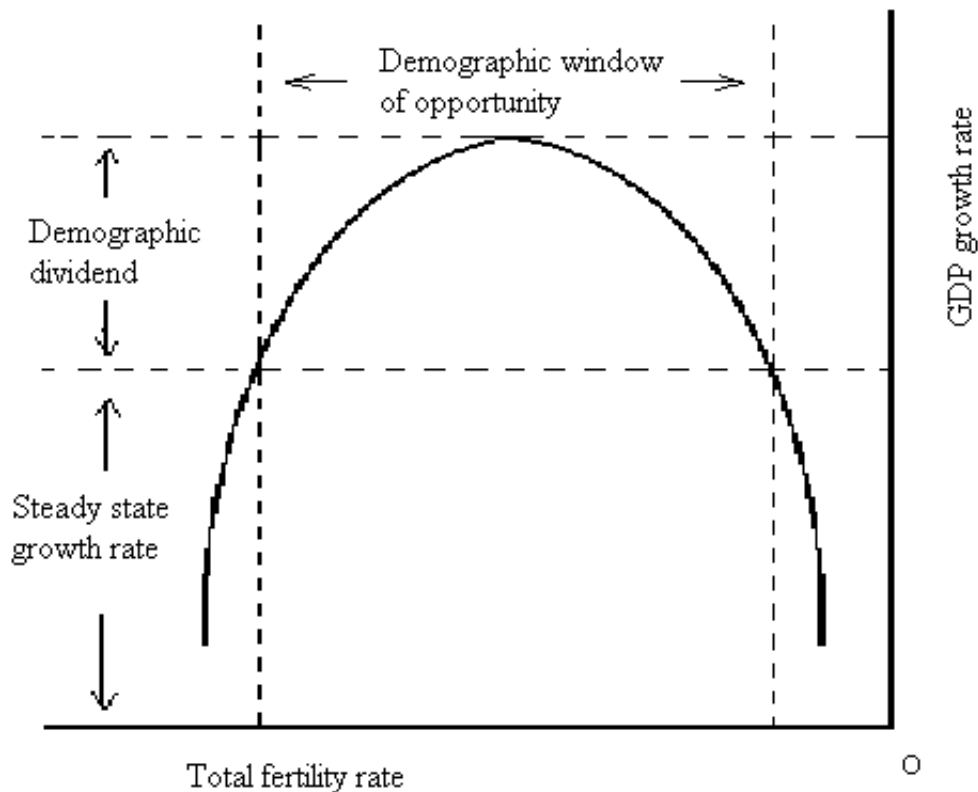


Figure 1 Relationship between Fertility and Economic Growth

It is worth noting that factors impacting the performance of economic growth are multifold, not just of population. This is also true in explaining both the steady state of growth rate of low income economies, known for poverty trap, and the steady state of growth rate of high income economies struggling in technological innovation frontier. For example, in the empirical works of defending neoclassical growth theory, economists have found more than one hundred explanatory variables, which are statistically significant in unveiling determinants of growth performances, but none is sufficient and exclusive (Sala-i-Martin, 1997). For simplicity, we also put aside the retroaction effect of economic growth on demographic transition¹ and focus on the straightforward relationship between fertility and economic growth. Under the assumption made above, this fertility-growth nexus can be deduced from the theory of demographic dividend and confirmed empirically.

The panel data from World Development Indicators enable us to picture a descriptive

¹ In an econometric study, Du (2004) found that population policy, per capita GDP and level of human capital are decisive factors driving down China's fertility and empirically identified the different effects of the three factors.

relationship between annual GDP growth rates and TFR levels among countries in the period of 1960 to the recent years. For those countries and years, in which data are available, annual GDP growth rates are ranged from -51 to 106 percent. To avoid the complication of explaining the outliers, we ignore those extreme numbers and only investigate those between 0 and 10 percent, which are assumed to be normal span of annual GDP growth rate. According to foregoing discussion, the relationship between economic growth rate and fertility is not a simple linear one but follows a algebraic relationship of a quadratic function. That is, as TFR declines, the economic growth rate increases first and then declines. In Figure 2, according to the function relations between GDP growth rate and TFR and square term of TFR, we present the fitted value of annual growth rate of GDP with 95 percent confidence interval.

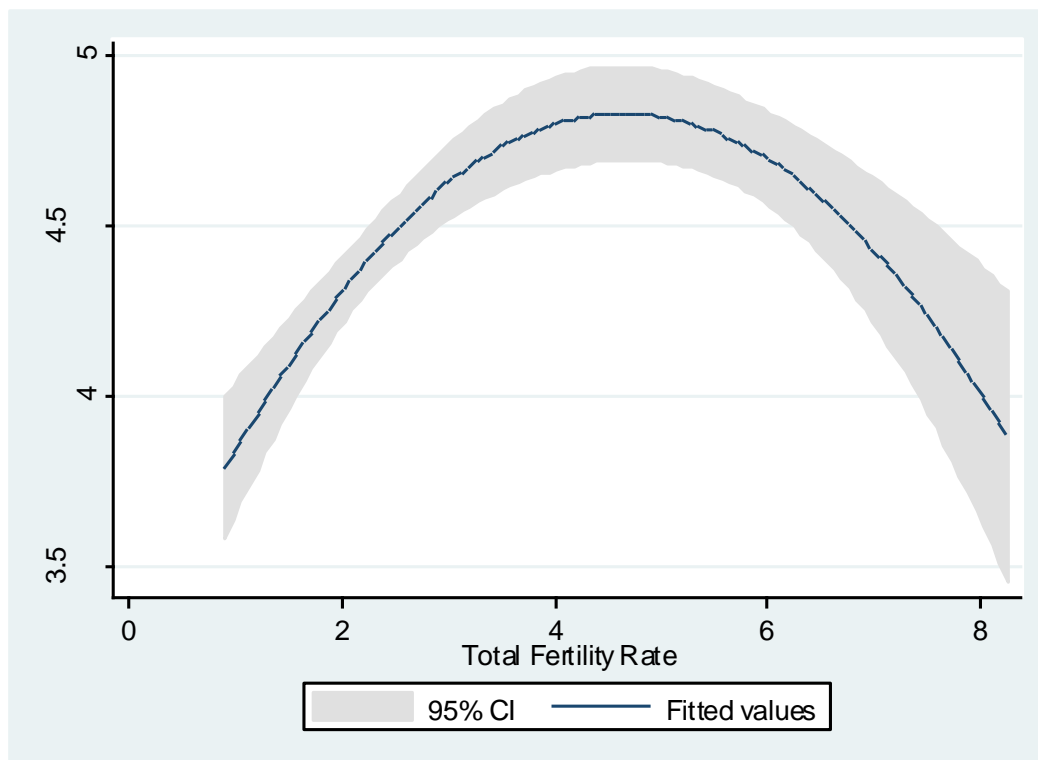


Figure 2 Empirical Relationship between TFR and GDP Growth

Source: Calculation based on dataset of *World Development Indicators*

Figure 2 intuitively pictures reversed U shape pattern of GDP growth rate against decline in TFR – countries at the lower stage of demographic transition characterized by high TFR usually suffer poor economic performance; as their TFR levels fall, economic growth

speeds up; after a certain point, as TFR further declines and demographic transition enters later stage characterized by very low TFR, economic growth tends to slow down. Such a simplified empirical curve is perfectly consistent with the theoretical prediction described previously. To further examine the statistical significance of the relationship between TFR and economic growth, by assuming the nonlinear correlation and using foregoing data, we regress GDP growth rate on TFR and squared term of TFR (Table 1). The regression results show the reverse U shape relation between GDP growth and TFR by revealing the significantly positive sign of TFR coefficient and negative sign of squared term of TFR.

Figure 1 Regression Results: the Relation between TFR and Growth

	Coefficient	Standard error	t value	P> t
TFR	0.6852	0.1133	6.05	0.000
TFR square	-0.0736	0.0137	-5.38	0.000
Constant term	3.2359	0.1909	16.95	0.000
Observations		3380		

While the more precise explanation based on both economics theory and empirical evidence requires much more works, the plain fertility-growth nexus here is a sufficient framework, in which we are now in the position of investigating actual relations between demographic transition perceived in demography, demographic dividend coined by demographic economists, and Lewis turning point deduced from development economics, based on China experiences. In the next section, we will analyze the formation and anticipated disappearance of demographic dividend, and verdict the advent of Lewis turning point in the process of China's economic development.

3. The Economic Impacts of Chinese Demographic Transition

In the first two decades after the establishment of People's Republic of China in 1949, the economy rapidly recovered and people's living standard well improved, which pushed

China's demographic transition into second stage. That is, eliminating the abnormal years between late 1950s and early 1960, mortality substantially fell, birth rate kept at a chronic height, and as a result natural growth rate was constantly high. TFR had kept as high as 6 until 1970s and afterwards it declined dramatically. However, the fastest decline of TFR had happened before the one child policy formally implemented. TFR dropped by 3.5 percentage points, from 5.8 to 2.3 in the decade of 1970 to 1980, while it dropped by 0.5 to 0.7 percentage point in the entire period between 1980, in which the central government announced a compulsory population control policy, and the present day, when TFR is agreed to be 1.6 to 1.8, which are both well below replacement level. Such a fact shows that the orderly switchover of major stages of demographic transition is primarily the result of economic growth and social development. In the period of demographic transition from second to third stages, population at working ages grows faster than dependent population and therefore proportion of working age population becomes larger and larger, which has released demographic dividend and upgraded economic growth rate to a level above steady state.

Although the population dependence ratio – namely, the ratio of dependent population aged 14 and younger and 65 and older to working age population aged 15 to 64, declined as early as in the mid of 1960s, the substantial increase of working age population and its share in total population, associated by dramatic fall of population dependence ratio, started in the mid of 1970s (Figure 3). Such a favorable age structure of population has been translated into demographic dividend that spurred unprecedented performance of economic growth. A series of publications (for example, Cai, 2008; Cai and Wang, 2005) explain the rationale, process and empirics of the demographic dividend in the development of dual economy of China. Those studies also argue that as such a dividend begins diminishing at the stage of demographic transition characterized by low birth rate, low mortality and low growth rate of population, the development of the Chinese dual economy has reached its critical period of time, the Lewis turning point. This paper is an endeavor synthesizing demographic transition, demographic dividend and Lewis turning point, accounting for the logical and historical relations between the three concepts and revealing the challenges facing the Chinese economy in a changing era.

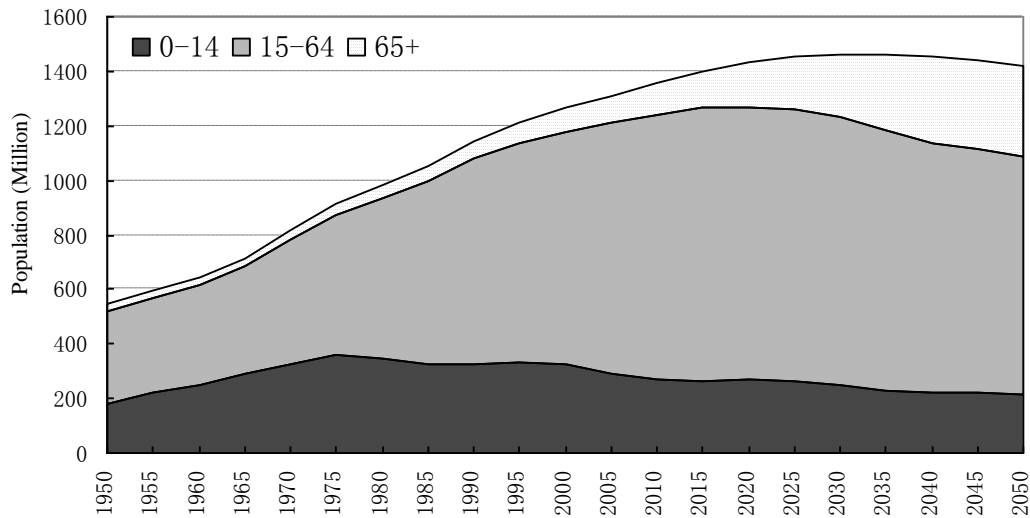


Figure 3 Changing Trends of Age Structure of Population

Source: United Nations, 2009

The prediction of China's population and its age composition by United Nations (2009), shown in Figure 3, is a scenario of medium variant and consistent with the 2000 census, the 2005 sample census, and updated (to 2008) estimates of the subsequent trends in fertility, mortality and international migration. This prospect is by and large identical to those made by various Chinese units. According to this prediction, total population of China is going to reach its peak in 2030 and amount to 1.46 billion. Much sooner than that, the working age population aged 15 to 64 will reach its peak, 998 million, in 2015. Although such prospects can be in time obtained from public source, it is obvious that they are unknown information not only for the public but also for many of economists. To acquaint oneself of the changing trends of Chinese population is definitely required for the scholars who are studying and speaking of the future of the Chinese economic development, and influencing the public.

Further examining the predicted results shown in Figure 3, one can find that the growth speed of working age population has been faster than that of total population in the period of 1970 to 2010, and the trend will turn to the other way round – namely, the age structure of Chinese population will be no longer evolved to be productive. As agricultural share of labor force declines over time, the current demand of urban sectors for labor has been sufficiently met by rural-to-urban migration. As an important part of the reform, opening-up and growth in the past 30 years, the massive migration has drawn worldwide attention and been

recognized as the largest movement of population in peacetime of human history (Roberts et al., 2004). In the recent years, as a result of long-playing adjustment corresponding to migration, there have occurred two new phenomena to the labor relocation. On the one hand, the migrant workers become further unwanted as mechanization of agricultural production has increasingly accelerated. On the other hand, the demand of urban sectors for migrant workers becomes more and more rigid and indispensable, as a result of shrinkage of urban local labor force (Cai, 2010).

According to another prediction, which takes into account the impacts of rural-to-urban migration (Hu, 2009), by 2015, the amount of incremental working age population in urban area will be less than that of reduced working age population in rural area (Figure 4), the same conclusion drawn by the above cited prediction. That implies that without substantial enhancement of wages and other incentives the migrant workers will not fill up the gap vacated by rapid reduction of urban labor force. In the course of urbanization, those migrant workers and their accompanying family members, who live in urban area for more than 6 months, are already counted as urban residents, the number of statistically recognized rural residents have been rapidly reduced. The labor market has gradually responded to this situation, which is embodied in tremendous enhancement of wages of ordinary workers, on the one hand, and nationwide labor shortage, on the other. According to the definition of development economics, those phenomena are signals of Lewis turning point.

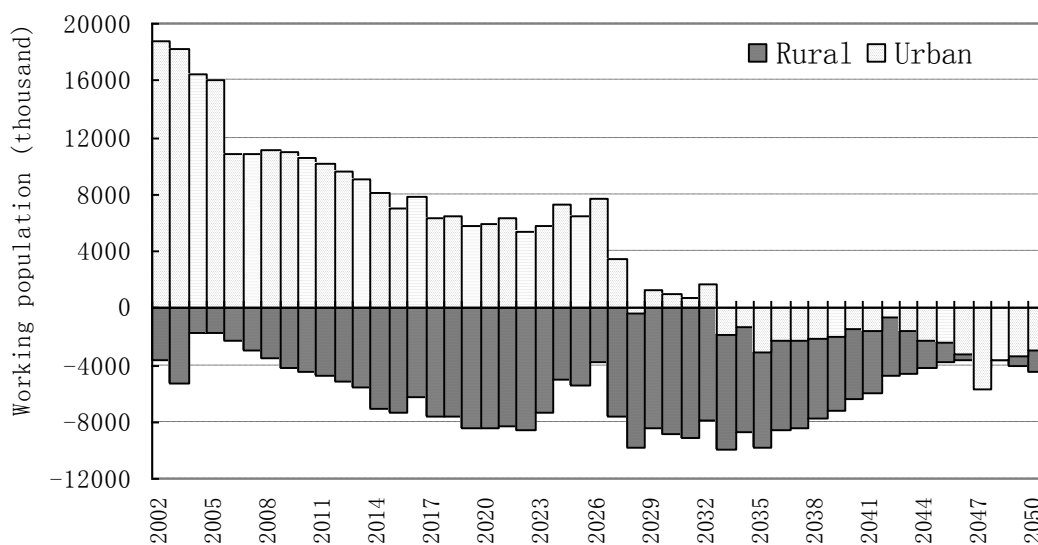


Figure 4 Changes of Working Age Population of Rural and Urban China

Source: Hu (2009)

4. How to Close the “Aging before Affluence” Gap?

The worldwide experiences show that economic growth and social development are major driving forces of demographic transition, while the implementation of population policy plays relatively minor role additional to the former. All like China, the Asian economies such as Korea, Singapore, Thailand and Taiwan, where no compulsory policy has been enforced, have experienced dramatic decline in fertility, from high TFR similar to China in 1950s to as low as below replacement level in 1990s. Even in India, where economic growth and social development have not performed as good as that in China and those economies, therefore demographic transition has been relatively lagging behind, fertility has also been declining by following the similar path (Lin, 2006).

In spite of its unprecedented economic growth in the past 30 years, due to its late outset comparing to the Asian economies above mentioned, China entered into the new stage of demographic transition at relatively low income per capita, which is characterized by “aging before affluence”. In 2000, the proportion of ages 65 and over in total China’s population was 6.8 percent, identical to the world average, whereas China’s per capita GNI was only 17.3 percent of the world average based on official exchange rate and 56.3 percent of the world average based on purchasing power parity. While one must admit that the strictly implementation of one-child policy is an accelerator pushing down the fertility, the demographic transition, in the final analysis, is the result of outstanding economic growth and social development (Du, 2004). The difference of income level between China and developed countries is therefore the root cause of the existing “aging before affluence” gap.

Most developed countries are facing the challenges of population aging to sustainable economic growth and pension insurance scheme, and the efforts and effects vary from country to country. However, the developed countries, being at high-income level, technological innovation frontier, and therefore with increasing productivity, have well dealt with the challenges and averted the old age crisis so far. Based on the experiences, one can be

confident that the key for China to tackle the challenges of shrinking working age population and enhancing older age population is to sustain its fast economic growth and quick increase in per capita income. In other words, demographic transition, thus population aging, is an irreversible process, which cannot be stopped even if one-child policy is abolished. The already formed “aging before affluence” gap can only be narrowed and eventually closed through catching up with the developed countries, which put China in the ranks of high income.

As the Chinese economy ascends itself in the world’s economic pecking order and is expected to become second largest economy after the United States in 2010, given its slowed down growth rate of population, per capita GDP level of China will rapidly step up. One long-term prediction on China’s economic size and per capita GDP conducted by Japanese Center for Economic Research (JCER, 2007) shows that based on PPP and the constant US dollar of 2000, China’s GDP volume will reach \$17.3 trillion in 2020, \$25.2 trillion in 2030, and \$30.4 trillion in 2040. The predicted per capita GDP in the three reference years are \$12 thousand, \$18 thousand and \$22 thousand, respectively. Even more optimistic prediction by Fogel (2007) expects that China’s total GDP will reach \$123.7 trillion in 2040, and based on the predicted population of 1.46 billion, per capita GDP will be as high as \$85 thousand then. Those two prospects are widely divergent in terms of methodology, data used, assumptions, and therefore the predicted results. Given the debatable usage of purchasing power parity GDP term by both researches, their prospects are unlikely to be accepted by Chinese scholars and officials.

The above-mentioned controversial prospects on China economic volume and per capita income, however, reveal the same facts that beginning from the second decade of 21st century, in the stance of second largest economy of the world, China will speed its transformation from middle-income country to high-income country. Suppose China can maintain the same pace of or even appreciably lower than the growth rates of both total and per capita GDP realized in the past 30 years, a significant convergence of wealth between China and developed countries will be realized. In this regard, the predictions made by foreign economists reflect the keerect direction and vision of near future, and as the result of the trends, under the assumption of unchanged demographic transition, the gap between

economic development level and population aging will be eventually closed.

In Figure 5, we compare China’s age structure of population with less-developed countries in the years of 2000 and 2010 to show the characteristic of “aging before affluence”, whereas we compare China’s age structure of population with more-developed countries in the years of 2020 to 2030 to show how the “aging before affluence” gap can be narrowed down and finally closed. This shows that the fundamental avenues to dealing with population aging in the post Lewis turning point era are threefold: (1) tap the potential of remaining demographic dividend, (2) create second demographic dividend, and (3) find new sources sustaining long-run economic growth.

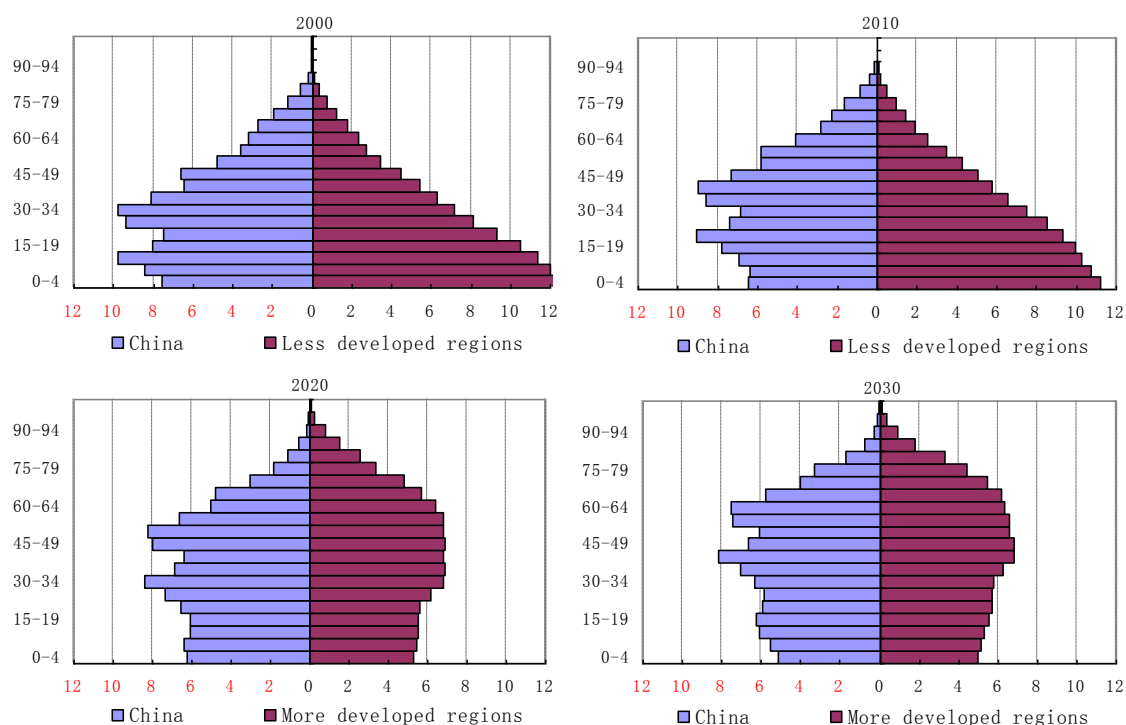


Figure 4 Narrowing the “Aging before Affluence” Gap by Economic Catching up

Source: United Nations, 2009

5. Conclusion and Policy Implications

The analysis on China’s demographic transition and its economic impacts convince us of the close relation between demographic transition and economic development, and thus the conclusion of diminishing demographic dividend and ongoing Lewis turning point is pursuant

with both economic theory and empirical evidence. Even the scorching debates around those judgments, to some extent, clue to that they are not solely academic discussions, that they also have important implications to policy decision.

The arrival of Lewis turning point is vital milestone for a developing economy, because only does it pass through this point that the marginal productivity of labor in traditional (agricultural) sector begins to converge that in modern (non-agricultural) sectors. When eventually the productivity gap among sectors disappears, the economy as a whole receives its commercial point and the long-standing dual economy terminates. Therefore, the advent of Lewis turning point is not dismal news at all. In contrast, being cognizant of this turning point has not only theoretical meaning but also practical significance. That is, it has important implications for governments in development policy formation, for enterprises in decision-making, and for individuals in adjustment in the face of labor market changes. In short, the sustainability of economic growth relies heavily on a sound response to the challenges brought forward by the new stage of development. What follows we examine the potential sources of China's sustained economic growth in post-Lewis turning point period, based on experiences of foregoer economies.

First, there still is potential of the existing demographic dividend to exploit in the short run. Let us first divide demographic dividend into two types: first demographic dividend and second demographic dividend. While the first demographic dividend can be defined as the scenario where labor supply is adequate and savings rate is high, thanks to the increasing magnitude and proportion of working age population, the second demographic dividend can be seen as the new motivation of savings resulted from precautions for the rainy day of aging and new supply of human capital supposedly brought about by postponing retirement age and extending education and training (Cai, 2009). The exploitation of first demographic dividend has been manifested in labor transformation from agricultural to secondary and tertiary sectors, accompanied by speedy urbanization. By 2009, urban residents who lived in cities for 6 months or longer reached more than 600 million, accounting for 46 percent of Chinese population. While according to the definition, part of longer stayed rural-to-urban migrants were counted as urbanites, because they do not legitimately have urban *hukou* and lack access to public services, of which urban residents with local *hukou* are inherently privileged, they

are not fully urbanized.

More specifically, because migrant workers and their accompanied families still expect to return home in rural area, periodically during the Chinese New Year period, and permanently after they are not needed by the urban labor market, (1) their supply of labor is not durative, (2) their consumption behavior is still rural, (3) they are not planned for the utilization of urban infrastructure, and (4) they have no incentives to contribute to the social security scheme, particularly to the fully-funded pension system. In 2007, the proportion of urban residents of total Chinese population, which includes those migrant workers who live in cities for more than 6 months, was 45 percent, whereas the proportion of population who have formal urban *hukou* was only 33 percent, which leaves an ullage of 12 percentage points gap between nominal and actual urbanization rates. By transforming farmers-turned workers to migrants-turned citizens through deepening the *hukou* reform and equalizing public services to all citizens, a more complete urbanization can make full use of the first demographic dividend (Cai, 2010).

Second, there is potential of second demographic dividend to tap in the medium run. An aging society can also possess advantage of population – namely second demographic dividend, as long as necessary institutional conditions are provided with (Lee and Mason, 2006; Cai, 2009). As one of the important causes for population aging, the increase of life expectancy – people live longer and healthier, is the foundation to generate the second demographic dividend. This kind of demographic dividend includes three major sources. A first source comes from the need of old-age supports and supply of pension institutions. As long as there is fully funded pension scheme instead of pay-as-you-go or family support system, the older and working longer workforce will have larger incentive to accumulate assets, and then high savings rate can be maintained by investing in capital market (Lee and Mason, 2006). A second source comes from the expansion of education resources. As the quantity of youth population reduces and its proportion in total population declines, the capacity of working age population maintaining population at school relatively enhances, which is a window of opportunity for extending education and training and hence accumulate human capital. A third source comes from expansion of labor force participation. Extension of retirement age is a major measure to enlarge workforce and alleviate the burden of old-age

supports, which is widely employed in developed countries. For China, the obstacle of extending retirement age is that the working elderly are usually less educated and thus unwanted by employers. Before this situation is changed, extension of retirement age may put them in a vulnerable circumstance. Therefore, the exploitation of such a dividend should take a gradual approach through expanding education, especially that at senior high school level liberal education and occupational education, and on-job-training, particularly for migrant workers.

Third, there is a great need to obtain a brand new driving force for the sustainable economic growth through growth pattern transformation in the long run. Assuming scarcity of labor and thus diminishing return to capital, the neoclassical theory of growth developed based on western experiences argues that the only way to maintain the sustained economic growth is to enhance the contributive share of total factor productivity (TFP) to it (for example, Solow, 1956). Based on this basic assumption, a handful of studies doubted the existence of East Asian miracle and, if there is, its sustainability (for example Young, 1992; Krugman, 1994). In reality, thanks partially to the characteristics of unlimited supply of labor and partially to felicitous economic policies favorable for exploiting demographic dividend, the East Asian economies had long averted the crisis of diminishing return of capital. As some major economies passed through their Lewis turning points¹, at the same time, the newly entered stage of demographic transition no longer provided first demographic dividend, those economies represented by Japan and the Four Tigers transformed their economic growth pattern from capital and labor driven to more TFP driven. Those experiences indicate that as first demographic dividend diminishes and Lewis turning point passes through, driving forces of the Chinese economic growth will be eventually transformed to a reliance on technological advancement and productivity enhancement. The assurance of changed stage of development requires to speed up the pace of growth pattern transformation.

¹ It is commonly believed that the Japanese economy in 1960 and Korean and Taiwan economies reached their Lewis turning point, respectively (for example Minami, 1968; Bai, 1982).

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