

The Future of the Demographic Overachiever: Long Term Implications of the Demographic Transition in China

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Abstract

China has been an overachiever in the global process of demographic transition. Its demographic transition is commonly seen as an exceptional case, for its sheer magnitude, drastic speed, and in particular, the prominent role of the state. In this paper I argue that the demographic transition process in China contains many similarities to demographic transitions elsewhere in the world. China, in other words, is not that unique in its demographic transition. The Chinese state has clearly played an extremely active role but such state intervention was conditioned by the particular economic and political system, and it began *after*, not before, the demographic transition was already set in motion. As an overachiever in the global demographic transition process, China also faces a faster unfolding of many of the consequences, including rising social risks for Chinese families, as exemplified by a large share of the elderly without offspring or kin at the last stages of their lives, an outcome in part due to the Chinese state's three-decade long one-child policy.

The Future of the Demographic Overachiever: Long-term Implications of the Demographic Transition in China

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China has been an overachiever in the global process of demographic transition in the second half of the twentieth century. Its mortality decline was unparalleled in human history, consequently setting the stage for rapid population growth, which in turn was used to justify an unprecedented state intervention in birth control. Its fertility decline, if anything, was even more extraordinary, for its speed and especially for the measures taken and the agencies involved. As China's fertility has dropped to well below the replacement level, what is in waiting for this demographic overachiever? In this paper I examine three issues related to China's demographic transition. First, I provide a brief review of the demographic transition process in China. Second, I discuss the role of the Chinese state in China's demographic transition, an aspect particularly salient in China's demographic transition and an aspect that has attracted the much attention and caused perhaps an equal amount of confusion. Third, using results of population projections, I highlight a few important facts of China's demographic future, in part as a result of its demographic overachiever status.

China: the Demographic Overachiever

By all major indicators, China has been a demographic overachiever. Demographic transition in China began with a highly compressed process of mortality decline, with a vast improvement in life expectancy in a matter of two decades (Table 1). At the middle of the twentieth century, life expectancy at birth for Chinese females, a major indicator of mortality level of the population, was in the low 40 years. This level was what the more developed European countries and the United States achieved a century ago (Figure 1a, path to rising life expectancy). At that time (1950) China's life expectancy at birth was nearly 30 years below the level achieved in industrialized European countries and in the United States. In the next fifty years, China achieved what it took these other countries a century to achieve, to increase life expectancy from the 40s to over 70. In 2000, whereas the gap in income level between China and the U.S. was still at around 1:10,¹ female life expectancy in China was only about five years below that of the United States, about 75 versus 80. China, in other words, completed its mortality decline while per capita income was at a very low level. Whereas China's mortality process fits well into the model of the worldwide mortality

¹ The per capita money income for the United States in 1999 was \$21,587 (U.S. Bureau of Census).

decline in many developing countries, its success is an extreme example. Government-led efforts on public health relying on simple, preventive measures and broad access to primary care are credited for such a broad and significant improvement in life expectancy (Banister 1987, Lee and Wang 1999).

(Table 1 about here)

(Figure 1a about here)

Such a drastic improvement in life expectancy, a result of a highly compressed mortality decline process, laid the stage for rapid population growth in China. In the two decades after 1950, crude mortality rate of the Chinese population was reduced by nearly 60 percent, from 18 per thousand in 1950 to 7.6 in 1970. At the same time, fertility level of the population, measured by the total fertility rate, stayed at roughly the same level, around 5.81 children per woman (Table 1). In the absence of a drastic fertility that corresponds to the rapid mortality decline, and in particular following a fertility rebound in the wake of the Great Leap Forward famine of 1959-1961, China had a rate of natural increase mostly in the high 20s per thousand in the late 1960s, a level implying a population doubling time once every 25 years (Table 1). Indeed, while it took ten years for China to add 100 million people from 600 million in 1954 to 700 million in 1964, it took only five years each to add the next two 100 millions. Such a rate and the magnitude of population growth were staggering, unprecedented in Chinese history and adding to the worldwide concerns of population explosion in the 1970s and the 1980s.

Not to be unmatched by its record of mortality decline, China's fertility decline process was even more compressed. As shown in Table 1, major fertility reduction in China took only half of the time it took for mortality, only one decade, from 1970 to 1980. In one decade's time, total fertility rate was more than halved, from 5.8 to 2.3, a record unmatched elsewhere. In contrast to Western European countries where it took 75 years or longer to complete a fertility transition from the level of a TFR of around 5 to the replacement level, in China a similar decline took only about two decades. Moreover, whereas in some European countries fertility stayed at the replacement for half century or longer before dipping below the replacement level, in China the time lag for that further decline was only about one decade (Table 1 and Figure 1).

(Figure 1b, paths to demographic transition)

The new phase of fertility decline in China began quietly and remained unnoticed for almost a decade, in the 1990s. The first signs of China's fertility dropped to below the replacement came in the early 1990s, when a national survey of fertility and contraception conducted by China's National Population and Family Planning Commission reported a fertility level of much below the replacement level. Such a number was quickly dismissed in the context of what was believed to be widespread

practices of births underreporting. Nevertheless, in all surveys since then, national fertility level has never been found to be above the replacement level. Finally, with China's 2000 census, a consensus was formed that indeed, the below replacement fertility seen from the early 1990s in China is no longer a disputable fact.

By the turn of the twenty-first century, it is beyond any doubt that China has entered its post-demographic transition stage. It is now widely believed that fertility in China nationally reached the below replacement level in the early 1990s (Cai 2008a; Gu 2008; Guo 2004a, 2004b, 2008; Guo and Chen 2007; Retherford et al. 2005; Zhang and Zhao 2006, Morgan, Guo, and Hayford 2009). By 2005, fertility in China was around 1.5 and possibly lower. In China's more developed regions, fertility has been even lower for more than a decade, barely above the one child per couple level. In ten of China's 29 mainland provinces and municipalities, fertility level based on the 2000 Chinese population census was 1.1 children per couple or below, a level that rivals the lowest fertility countries in the world (Gu et al. 2007, Chen et al. 2008). In roughly half of a century time, China, as other populations that have experienced the demographic transition, completed its journey from a low natural rate of increase due to high mortality and high fertility to low natural rate of increase as a result of low mortality and low fertility (Figure 2). In 2005, China's rate of population growth was around half per thousand, down from over 25 per thousand 35 years ago, in 1970 (Table 1 and Figure 2). For China, the historical importance of completing its demographic transition in such a compressed fashion has many dimensions. One of which is that in less than 15 years from now, for the first time in its own history China will no longer be the most populous country in the world.²

(Figure 2, vital rates)

The Chinese State in Demographic Transition: Instigator or Accelerator?

China's compressed demographic transition process under a strong centralized state has often led to the belief that China has been an exception in the global demographic transition process. Make no mistake that the role of the Chinese state is central and prominent, in establishing the national welfare distribution and public health system that contributed to China's vast improvement in life expectancy in a short time, and in establishing a birth control policy that is unprecedented in human history and a bureaucratic force that finds no equal in the world.

To credit China's demographic transition entirely or even mostly to the Chinese state, however, would be a grave mistake. A careful look at the timing and underlying process of China's demographic transition, as I attempt to do below, shows that both in terms of origin and agency, it is the Chinese population, not the Chinese state, who are the main motors behind China's demographic transition.

² This is according to the United Nations 2008 Revised Population Projection. With a constant fertility assumption, China's population by 2025 will be 1,443,979, in contrast to India's 1,502,063.

Origins

Looking more closely at the main indicators of China's demographic transition, one sees that the most impressive mortality reduction was completed by 1970, with a gain in life expectancy between 1950 and 1970 of roughly one year per calendar year, with infant mortality rate dropping from nearly 150 per thousand to less than 50, and with the crude death rate dropping to below 10 per thousand level. While mortality decline has continued since 1970, it has never matched the same pace of the two decades between 1950 and 1970.

What account for the drastic mortality decline in the two decades between 1950 and 1970? Studies of China's modern mortality decline have paid special attention to three factors: a socialist welfare distribution system that sharply reduced poverty and increased economic equality, a government initiated public health system that focused on prevention and provision of basic care at low or no cost, and the spread of modern health and medicine knowledge that began nationally from the early twentieth century (Banister and Preston 1981, Jamison et al. 1984, Banister 1987, Rogaski 2004). Of the three factors, the least known is the last, namely the long process of mortality decline that began prior to the communist takeover in 1949. As James Lee and I summarize in our 1999 book, *One Quarter of Humanity*, modern mortality decline in China began in the very beginning of the twentieth century, with the adoption of public health measures in selected populations. Studies during the last decade or so of historical populations of Republic era (1911-1949) provide much evidence of such an origin. Substantial mortality decline began first in Beijing, Tianjin, and other port cities (Benedict 1996, Campbell 1997, 2001, Rogaski 2004). A major contributor to such mortality decline was a fundamental shift in the practice of female infanticide and child neglect. Ansley Coale and Judith Banister's calculations show that by 1950, the level of excess female deaths had dropped to 5 percent, from over 15 percent before 1940 (Coale and Banister 1994). The proactive culture of mortality control, long existed in the Chinese population, facilitated the early adoption of public health measures in selected cities in the early twentieth century, and nationwide once the socialist government took control in the second half of the twentieth century. The historical roots of such a proactive culture of mortality control were summarized in our 1999 book, and further explored by other studies (Lee and Wang 1999, Campbell and Lee 2004, Derosas and Tsuya forthcoming).

Processes

China's fertility decline process shows an even more apparent root dating before the start of its strong state intervention and control. The first important fact of China's fertility decline is that it began prior to the completion of the major mortality decline. In fact, fertility decline started in selected regions and among a selected segment of the population as early as its rapid mortality decline began, in the 1950s. By the early

1960s, birth control in urban China was no longer limited to the minority. Soon after the compensatory baby boom following the Great Leap Forward famine, fertility in urban China started a precipitous fall, to a total fertility rate of only three births per woman in 1966. Peng Xizhe, with his study of regional variations in fertility decline, marked the year 1964 as the onset of fertility decline for urban China, and 1972 for rural China (Peng 1993, 104). By 1974, fertility level in urban China, measured by the total fertility rate, reached below the replacement level. For the last 35 years, it has never gone above that level (Figure 2). Since 1980 and for nearly three decades, in the wake of China's one-child policy, fertility level in urban China has stayed at a level that is barely over one child per woman, a level that rivals the lowest in the world. The similarity between the trajectory of fertility decline in China and in other regions in Asia without a strong government intervention program was noticed and documented by Ansley Coale and Ronald Freedman in their joint paper first presented in 1988, who observed that "the similarity in the demographic changes that took place between the 1950s and 1980s in these populations is striking," and concluded that "fertility in mainland China may have been brought down by intensive government programs, but the culture that led other 'Confucian' populations to reduce fertility without such strong government intervention may have helped make the Chinese policy very effective." (Coale and Freedman 1993, 218)

(Figure 2, urban and rural fertility)

The second less noticed fact of China's fertility decline is that for China as a whole, fertility transition was completed in the 1970s, prior to the launching of China's most ambitious and controversial one-child-per-couple policy in 1979. Between 1970 and 1980, in a decade time, the total fertility level in China was more than halved, from 5.8 to 2.3. Such a compressed fertility decline was unprecedented in human population history of all populations of significant size in the absence of wars, famines, and epidemics. The starting point of this time period, 1970, is somewhat arbitrary, as this year is not the starting point of China's demographic transition. It is simply a time point when the national fertility level in China began a mostly consistently downward trend. The choice of the ending point for this period, however, is deliberate. This is the year when China began its unprecedented one child per couple birth control policy, a policy that is not only unique, but also has often obscured the underlying processes and causes of China's fertility decline, a dominant force in the demographic transition of the world's most populous country. It is largely due to the continued presence of this unique policy that China's demographic transition can be viewed as different or unique from the processes elsewhere in the world.

Not only was China's most significant fertility decline took place prior to the government's most draconian birth control policy, in the decade immediately following the one-child policy, fertility level for China as a whole hardly changed. The 1980s was a decade of give-and-take, ups-and-downs, with fertility level

fluctuating around 2.5 births per women. As shown in Table 1, the level of TFR stayed exactly the same for 1980 and 1990. The role of the government intervention was prominent, as part of the reason for this seesaw in fertility trend was the effect of relaxing the late marriage age rule, with earlier marriage age causing a births heaping (Feeney and Wang 1987). Another important reason was a backlash against the initial forceful implementation of the one-child policy, leading to small baby booms following the government's adjustment of the policy in the mid 1980s (Greenhalgh 1986).

The latest evidence of the independent role of the Chinese population, not the state, as the main motor of China's demographic transition especially fertility decline comes from a number of recent studies among Chinese couples who are not subject to the one child policy rule. China's one child policy, the trademark of China's birth control program for the last three decades, covers the majority of the Chinese population. Currently, nearly two-thirds, 63%, of all Chinese couples are still under the one child per couple requirement (Gu et al. 2007). The policy at the same time contains numerous exemptions that allow couples to have two children, who make up the other third of the Chinese couples (Wang 2005, Gu et al. 2007). One little known fact is that a number of locales in China have been exempted from the policy for a variety of historical reasons. The other, better known, is that couples who are only children themselves can have two children. In four largely rural locales with a combined population size of over 8 million that have not implemented the one-child policy, studies show that fertility in these regions has similarly dropped to below the replacement level and often to a level that is lower than the surrounding areas. Moreover, while the provinces in which these study areas are situated all have an abnormally high sex ratio at birth, one of the often discussed negative consequences of the one child policy, in these areas exempted from the one child policy, sex ratio at birth has remained within a normal range (Gu and Wang 2009). In a separate study of fertility intention and behavior, in six largely rural counties in Jiangsu province with a combined population size of over 5 million, over half of couples who are qualified to have two children report that they intend to stay with only one child, citing mostly economic and cost related concerns (Zheng et al. 2009).

China's fertility transition, as we have documented and argued elsewhere based on historical population records, traces its roots to a cultural tradition of proactive reproductive control long before the modern fertility decline (Wang, Lee, and Campbell 1995, Lee and Wang 1999, Campbell, Wang, and Lee 2002, Lee, Campbell, and Wang 2002, Wang, Campbell, and Lee forthcoming). Whereas the Chinese population did not exhibit the same behavioral form of marital control, namely curtailing fertility by delaying or foregoing marriage, as seen in historical European populations, they relied on other forms of control, mostly within the marriage institution. Means of control ranged from female infanticide (which also results in male celibacy), spacing, and in some cases early stopping. Regulating marital sexual life was a major mechanism to achieve the goal of fertility control. Such a practice not

only existed in the past, but also persists today in the context of post demographic transition. Couples not realizing their preferred size and sex composition of offspring have a higher sexual intercourse frequency than those who have (Lavelly 2007).

The institutional foundation to account for such a behavioral pattern of multiple controls was the Chinese collective (Lee and Wang 1999). Prior to the demographic transition, it was the Chinese family. The family was replaced by the Chinese state during China's socialist years. In dismantling the socialist planned economy in the last 30 years, the Chinese state has also returned the rights and responsibilities of economic production to the Chinese family, though up to this date the state has not relinquished its control over reproduction. To the effect that the Chinese state designed and implemented the most draconian birth control policy in the world, its economic system under the socialist planned economy also encouraged reproductive free riding and sustained high fertility in rural China (Johnson 1994, Lee and Wang 1999).

To summarize, China's demographic transition is not that unique after all. Yes, indeed, the Chinese state has played a strong hand in controlling population growth in China, but the Chinese population as those in other parts of the world in the past were keenly aware of the consequences of their reproductive decisions and behaviors, and regulated their fertility accordingly. Chinese people are the primary motors of China's demographic transition. The state did not start the demographic transition. Chinese individuals and families did. The state has served as an accelerator, more so in mortality decline than in fertility decline. The demographic transition process in China reveals not the might but the limit of the state. Individual and institutional adaptation to declining mortality and the separation of production and reproduction are the core causes of the demographic transition. The state is only one institution in the process and not always the most relevant. The myth of the state's role in China's demographic transition not only contradicts the important historical facts that are often obscured by the presence of a strong state policy, but also contributes to a misguided view that justifies continued state intervention, which could well lead the most populous country in the world to its demographic doom.

Long Term Implications of China's Demographic Transition

Clarifying the state's role in China's demographic transition, especially its role of the very low fertility level achieved, bears important implications for understanding the China's demographic, social, and economic future. If China's demographic transition, especially its journey to low and very low fertility, was not an outcome of state initiation and intervention but achieved largely by individual volition, then the long term demographic prospect in China may not differ from other populations in the world where the transition was completed earlier. Moreover, since China's demographic transition took place within a relatively a short time frame, many of the consequences of the demographic transition that have been observed elsewhere have

also emerged earlier and are unfolding at a faster pace. China in other words is likely to pay a price for being a demographic overachiever. With its population size still the largest in the world, China's changing demographic profile will also have an important impact for the whole world.

Prospect of Population Decline and Accelerated Aging

With fertility level below the replacement level for nearly two decades, the momentum of population decline has already been set in motion in China. To illustrate such a prospect for China, we use two common tools of demographic analysis: calculating the intrinsic rate of population growth and carrying out population projections. The intrinsic rate of growth, or r , is a measure of population growth based on only fertility and mortality levels of the population, while leaving out the effect of population age structure. It shows in the absence of the influence of population age structure, what would be the true or intrinsic rate of growth, as implied by the level of fertility and mortality.³ In Figure 4, we present the results of our calculation for China for the period of 1950 to 2006. To compare this rate with the observed trajectory of population growth, we plot in the same figure the rate of natural increase (NIR). Whereas the observed rate of natural increase has dropped precipitously from the early 1960s to its current low level of around 5 per thousand, it is still positive, representing a net population growth. The intrinsic rate of population growth, however, shows a complete reversal in a 30-year time period: from around 20 per thousand in the mid 1970s and roughly *negative* 20 per thousand in 2005. Just as a 20 per thousand rate of growth implies a population doubling time of about 30 years, a negative 20 per thousand means population size to be halved once in about every 30 years.

(Figure 4 about here)

China's population size, however, will not be halved in the next 30 years, due to the effect of its population age structure, or the momentum of population growth. A relatively young population age structure, even with a below replacement fertility rate, is still producing more births than deaths, hence net population growth. Such a momentum is shown in the results of our population projections, shown in Table 2. Even if China continues with its policy required fertility level, at a TFR of 1.47, its total population size will continue to grow for another decade or so, to 1.35 billion in 2023.⁴ If China's currently fertility rate is at the level of 1.6, a level recognized officially, its maximum population size will be 1.38 billion, reached in 2026, less than 20 years from now.

³ Calculating the intrinsic rate of growth requires the calculation of two other measures, the net rate of reproduction (NRR) and the mean length of generation (T). For details of our calculations, see Wang, Guo, and Mao 2008.

⁴ Calculations based on local fertility policies show that at the end of the 1990s, fertility level required by policies in China should be at a TFR level of 1.47 (Gu et al. 2007).

(Table 2 about here)

Once the population becomes older, as it inevitably does, the momentum of negative growth will kick in. Such a prospect of population decline and aging is also shown in the projection results in Table 2. Should China's fertility remains at a low level, either dictated by the current government policy or at the currently observed level, population decline and aging will undoubtedly characterize China's demographic profile for much of the twenty-first century, if not longer. In our projections, we assumed in two of the three scenarios that within 30 years China's fertility level will be raised to the replacement level (by 2037), and in one of the three scenarios, we assume the indefinite implementation of the current policy, which requires on average a couple to have 1.47 children. Even under the first two scenarios, once fertility restores to the replacement level, China's population decline will continue for another half century or more. In the process, China's total population size will be reduced by 220 to 300 million from its peak, and the median age of the population will increase drastically, from 30 in 2000 to close to 50 in the next four decades. Should China not be able to raise its fertility to the replacement level, by the end of the current century, China will have a population size only about half of what it is now.

Economic Implications

A rapid population aging and a sustained process of population decline in China have profound implications for China's as well as the world's economy. In the last two and half decades China has witnessed a period of unprecedented economic growth and increase in the standards of living in its history. Right now, that period of growth was punctuated by the worst financial crisis since the Great Depression, and much of the world's focus is on how to reestablish a healthy capital market and to return to the path of economic growth. What is not being noticed, however, is that this economic turning point also coincides with another turning point that may have an equally if not more pivotal role for the world's, at least the Chinese, economy.

This less noticed factor is China's changing demography. China's economic boom in the last thirty years has been driven by many factors. If one focuses on the key factors for economic growth, aside from institutional changes, there is clearly the role of capital investment. Foreign direct investment, especially that from overseas Chinese, brought in not only capital but also technology and management knowhow (Huang 2003, Arrighi 2007). Foreign consumer demand, especially that in the United States fueled first by the dot-com boom and then by the housing and stock market boom, supplied a huge market for China's exporting industries. Capital and market alone, however, could not make China the world factory in the last two decades of the twentieth century without the hands of the hundreds millions of Chinese laborers. China's economic boom has relied on another crucial factor, namely a young and productive labor force. Such a labor force, a non-repeatable historical product due to the rapid demographic transition, was present fortuitously as the Chinese economy

was about to take off. The large birth cohorts of the 1960s and 1970s were at their peak productive ages when the recent economic growth boom began, as shown in Figure 5. The benefit of such a demographic fortune, measured as the demographic dividend, is estimated to have accounted for 15 to 25 percent of China's economic growth between 1980 and 2000 (Cai and Wang 1999, Wang and Mason 2008).

(Figure 5, age structure change)

For the most part, China has exhausted its demographic fortune measured by the first demographic dividend, or the change in the support ratio between effective producers and effective consumers (Wang and Mason 2008). As shown in Table 3, between 1982 and 2000, China enjoyed an average annual rate of growth in the support ratio of 1.28 percent, a number that can be equated to the annual rate of growth per effective consumer, or the growth rate of the economy. Currently, that net gain due to favorable demographic conditions has been reduced to only one-fifth of its level of 1982 to 2000. In four years, by 2013, the growth rate will turn to negative, namely the growth rate of net consumers will exceed the growth rate of net producers. Our estimate is that such a negative growth rate will carry a toll of at least half of a percent per year for economic growth rate.⁵ Compared with other economies, between 2013 and 2050, China will not fare much better than Taiwan or Japan or Taiwan, and will fare much worse than the U.S. and France, just to use a few comparisons.

(Table 3 about here)

As a result of China's very low fertility in the last two decades, the era of abundant young and inexpensive labor is soon to be history. The number of young labor aged 20 to 29 will stay about the same for the next few years, before a precipitous drop beginning in the middle of next decade. In ten years, between 2016 and 2026, the size of the population in this age range will be reduced by about one quarter, from 200 million to 150 million (Figure 6). For the younger age group, aged 20 to 24, that decline will come sooner and more drastic: in the next decade, their size will be reduced by 50 percent. Such a drastic decline in the young labor force not only ushers in for the first time ever in recent Chinese history successive shrinking labor force entrants cohort size, it will also have profound consequences for labor productivity, as these are the youngest and the most recently educated, and for consumption, as these young people are also the most active consumers, from wedding banquets to new housing units. As a major player in the global economy, the impact of China's demographic change will not be limited to its own geographic boundaries.

(Figure 6, births and labor)

⁵ This is a conservative estimate because in our projection of population change for calculating the demographic dividend we assumed a fertility level that is higher than observed recently in China, a TFR of 1.8 instead of 1.5.

Social Implications

As part of the global process demographic transition, China will face similar social consequences, such as an aging population. As a demographic overachiever, China's aging process will also be faster than many other populations. In addition, in part because of China's one child policy that explicitly privileges the birth of a son over a daughter, sex ratio at birth in China has risen and stayed at an abnormal level of 120 boys over 100 girls or even higher in recent years, causing alarms that as many as twenty million or more Chinese men will be life-long involuntary bachelors.

What sets China apart from other societies that have experienced the demographic transition, however, is a social cost and risk resulting from numerous families with only one child. A unique component of China's demographic transition has been a government policy that requires the majority of Chinese couples to have only one child. Such a policy will result in a social consequence that is not seen in other populations of post-demographic transition. Over the last three decades, in no small part due to the implementation of the one-child policy, China has accumulated nearly 160 million single children aged 0 to 30.⁶ Such a number implies that as many as over 40 percent of the Chinese households have only one child. Taking into account of the very young only children who may have a sibling in the future, it is safe to assume at least over a third of all Chinese households may well end up with only one child.

Such a large number of families with only one child, often against the will of the parents, present serious economic and social risks for Chinese families, and for the whole society. The tragic deaths of thousands of only children in the earthquake of May 2008 in Sichuan serve only as a wakeup call to highlight such an extreme misfortune, that parents lose their own children and for many of them, are too late to replace their lost only children. With the current government birth control policy in place and low fertility level in continuation, by the middle of the current century, half of Chinese women aged 60 will have only one child. Even with the low mortality level, some Chinese parents will still face a most unfortunate reality: their children will die before themselves and they will die in total loneliness. The numbers shown in Table 4 illustrate the magnitude of such a risk for elderly Chinese parents with only one child. At age 60, 70, and 80 and assuming the current age specific mortality schedule, Chinese men and women could still expect to live for a number of years. For men, the likelihood that their sons will die before themselves ranges from 3 to 6 percent. For women, due to their average longer life span, the likelihood ranges from 6 to 17 percent. For Chinese parents who rely on their children for old age emotional and instrumental if not financial support, the prospect of dying alone is certainly among the cruelest imaginable. Multiplying the percentages here with the large number of only children parents in China so far, the sheer number of elderly living without any children is more than significant.

⁶ China's 2005 National Population Survey counted 2,098,947 only children aged 0 to 30. With a sampling ratio of 0.01325, this number translates into 158,411,094 only children nationwide (SPFPC 2009, p. 198).

(Table 4 about here)

Conclusion

For much of the world's civilization history, China has accounted for roughly one quarter of the human population (Lee and Wang 1999). In the second half of the twentieth century, China completed its demographic transition, joining most other developed and developing countries. China's demographic transition also took place with an almost unparalleled pace, with most of its mortality decline accomplished in two decades and fertility decline in only one decade. The significance of China's demographic transition is therefore not only for its size, as the world's largest population, but also for the speed of its transition. China, in other words, is an overachiever in the global demographic transition.

What sets China apart from the rest of the world in the demographic transition process is not just the role of the Chinese state in facilitating and enforcing mortality and fertility decline. The Chinese state has certainly been a crucial actor, but the more important actors are the Chinese individuals and families. A proactive culture of mortality control and reproductive regulation, long in existence and a central cultural component in China, served as the basis for China's mortality and fertility decline. Focusing only on the role of the Chinese state not only misses the true engines of China's demographic transition, but also contributes to an under-appreciation of the long-term implications of China's demographic transition.

China's rapidly decreasing young labor force, a result of very low fertility for nearly two decades, is ending the era of abundant supply of inexpensive labor for the world's largest manufacturing center emerged in the last two decades. Such a demographic shift in China should have far-reaching ramifications for the global economy. As China's low fertility is largely an outcome of individual volition and choice, constrained as in other parts of the world by the new political economy, a reversal of China's three-decade long one-child policy is unlikely to result in a substantial increase in fertility, and to reverse the momentum of population decline that has already been set in motion. Moreover, a simultaneous process of rapid population aging will accompany the shrinkage in the size of the young labor force. These parallel changes in opposite directions will no doubt fundamentally reshape the Chinese economy and society. In addition, and largely caused by China's forceful implementation of the one-child policy, Chinese families especially elderly will face another cruel social reality, namely life in loneliness due to the lack of children and kin. Having gained as an overachiever in the demographic transition, China now must be prepared to pay for the costs.

Table 1 Major Indicators of China's Demographic Transition

Indicator	1950	1970	1980	1990	2000	2005
Population Size (millions)	551.96	829.92	987.05	1143.33	1265.83	1307.6
Birth Rate (per thousand)	37	33.43	18.21	21.06	14.03	12.4
Death Rate (per thousand)	18	7.6	6.34	6.67	6.45	6.51
Rate of Natural Increase	19	25.83	11.87	14.39	7.58	5.89
Total Fertility Rate	5.81	5.81	2.31	2.3	1.6	1.5
Life Expectancy (Female)	45.6	63.2	69.25	70.47	73.33	74.45
Life Expectancy (Male)	42.2	61	66.4	66.84	69.63	70.72
Infant Mortality Rate (Female)	130.18	48.59	33.72	33.48	33.75	22.26
Infant Mortality Rate (Male)	145.85	54.24	35.56	32.36	23.92	18.51
Illiteracy (% of population)			22.81	15.88	8.99	7.88
Percent Urban	11.18	17.38	19.39	26.41	36.22	42.99
GDP per capita (RMB yuan)	119	275	463	1644	7858	14065

Sources and notes: SPFPC 2009.

Table 2 Post-Transition Demographic Prospect, China

	Scenario		
	I	II	III
Momentum of Population Growth			
Peak Population Size (millions)	1350	1382	1350
Year Peak Reached	2023	2026	2023
Momentum of Population Decline			
Length of Decline after Replacement Fertility	54	49	70+
Reduction in Population Size (millions)	308	220	673
Highest Median Age (year)	47.6	45.6	52.9
Year Peaking Median Age Reached	2047	2044	2100

Notes: Scenario I assumes fertility stays at the level of a total fertility rate level of 1.47 for 30 years from 2007 and then restores to the replacement level of 2.1; Scenario II assumes fertility level stays at 1.6 for 30 years then restores to the replacement level; Scenario III assumes fertility stays at 1.47 indefinitely.

Source: Wang, Guo, and Mao 2008.

Table 3 Average annual rate of growth in the support ratio (%), 1982-2050, China and other selected societies

	1982-2000	2000-2013	2013-2050	1982-2050
China	1.28	0.28	-0.45	0.15
Taiwan	1.07	0.01	-0.60	-0.04
Japan	-0.18	-0.24	-0.60	-0.42
United States	0.44	-0.46	-0.04	0.01
France	0.4	-0.41	-0.17	-0.06

Source: Wang and Mason 2008, 149.

Table 4 Risk of Childless among Elderly with Only One Child

Age	<u>Male</u>			<u>Female</u>		
	60	70	80	60	70	80
E _x	13.89	10.78	6.52	20.41	13.32	7.73
<u>% a son dies before parent</u>						
35	0.04			0.08		
45		0.06			0.12	
55			0.06			0.17
<u>% a daughter dies before parent</u>						
35	0.03			0.06		
45		0.04			0.08	
55			0.04			0.11

Source and notes: calculated from United Nations Model Life Table (Far Eastern Model), with male life expectancy at birth of 71 and female of 75 years old. For illustration purposes, a child's age is assumed to be 25 years younger than the parent. Percent diseased is calculated for the interval of a child's age and the average life span of the parent. Rounded to the nearest number in the life table.

Figure 1a Path to Rising Life Expectancy: Selected Countries

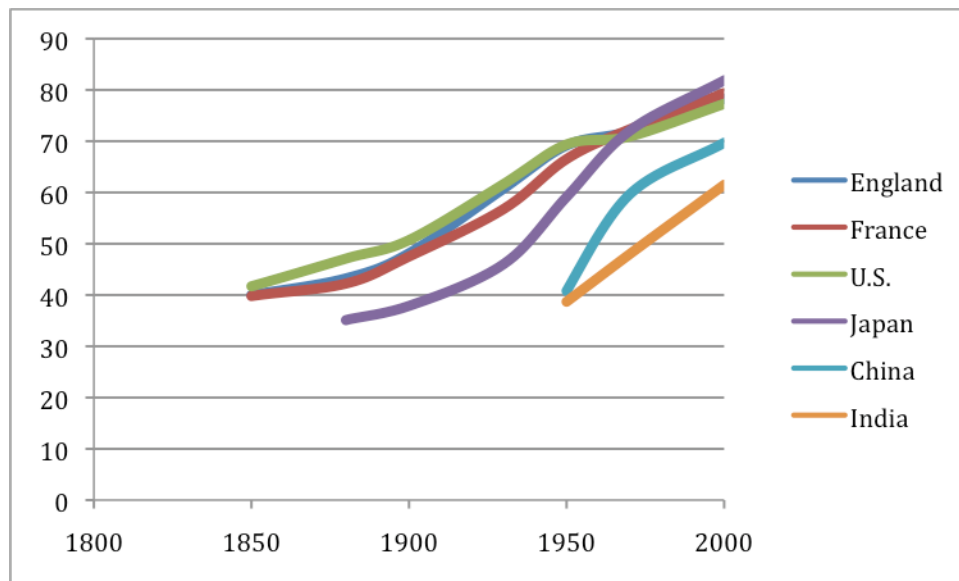


Figure 1b Path to Below Replacement Fertility: Selected Populations (TFR)

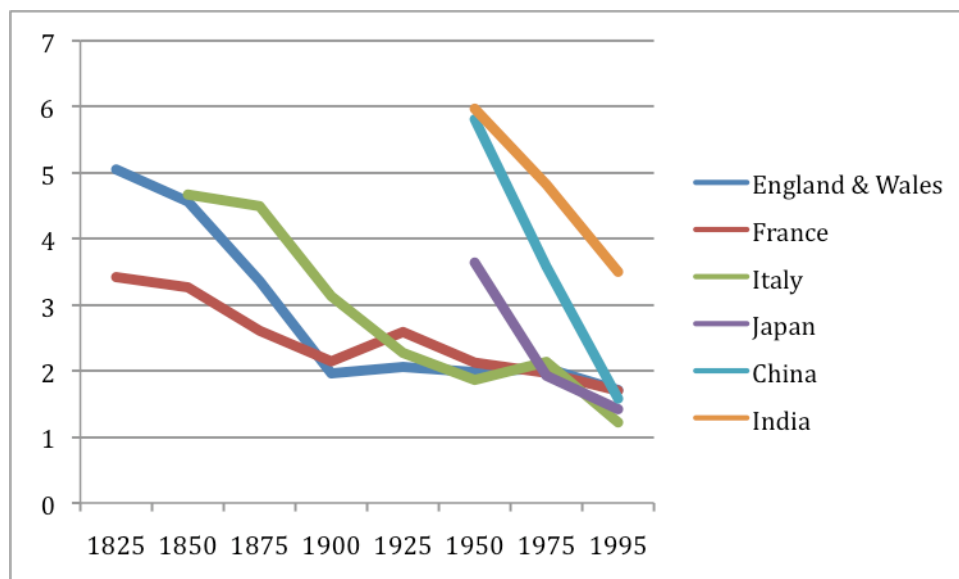


Figure 2 Vital Rates, China, 1949-2006

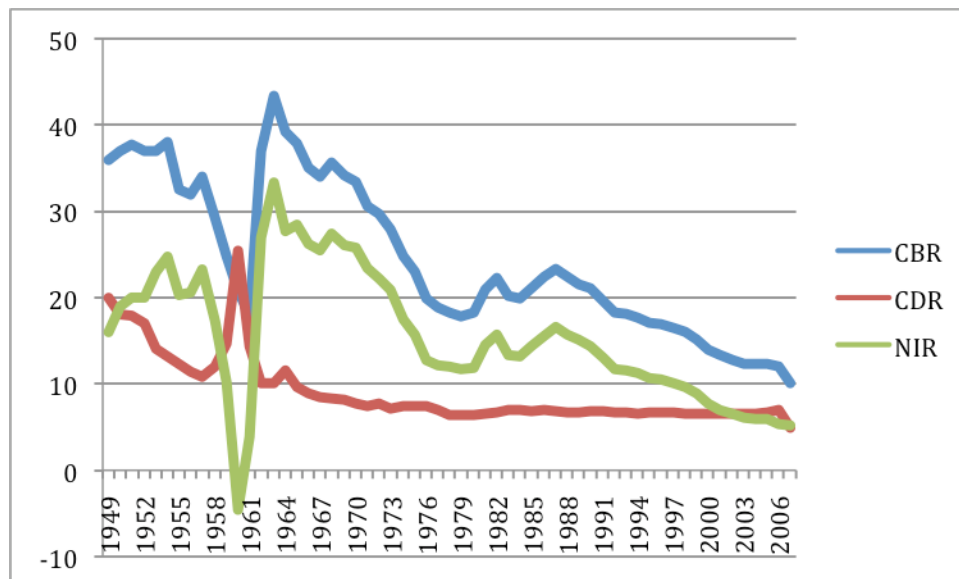


Figure 3 Trajectories of Fertility Decline (Total Fertility Rate), China, by Urban and Rural Areas

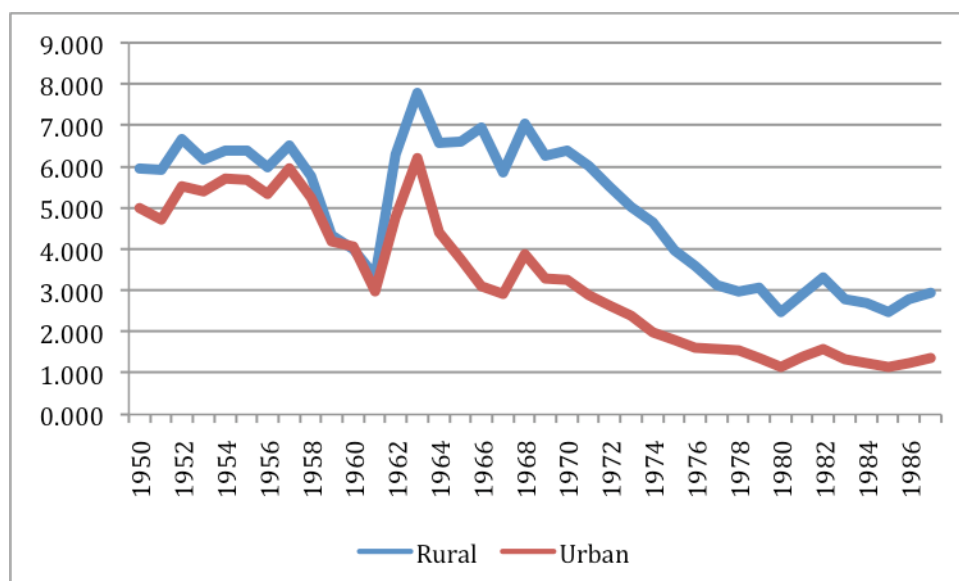


Figure 4 Observed and Intrinsic Rate of Natural Increase, China, 1950-2006

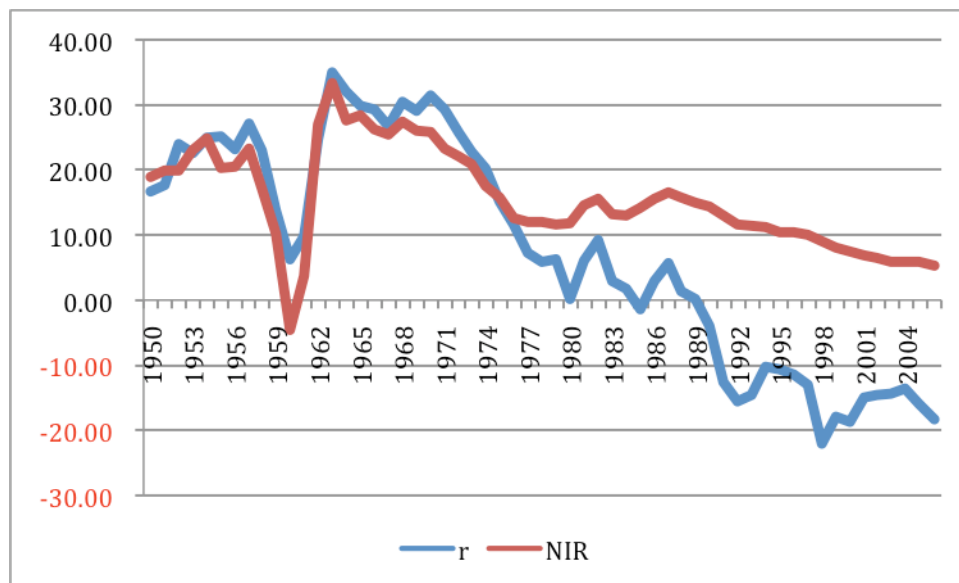


Figure 5 Population Age Structure, China, 1982, 2000, 2050

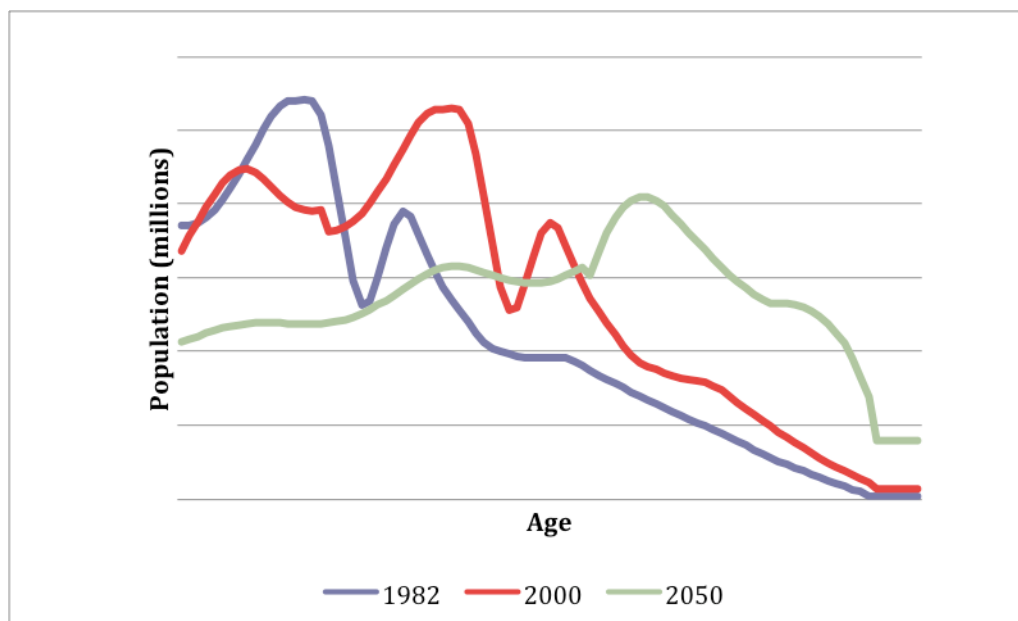
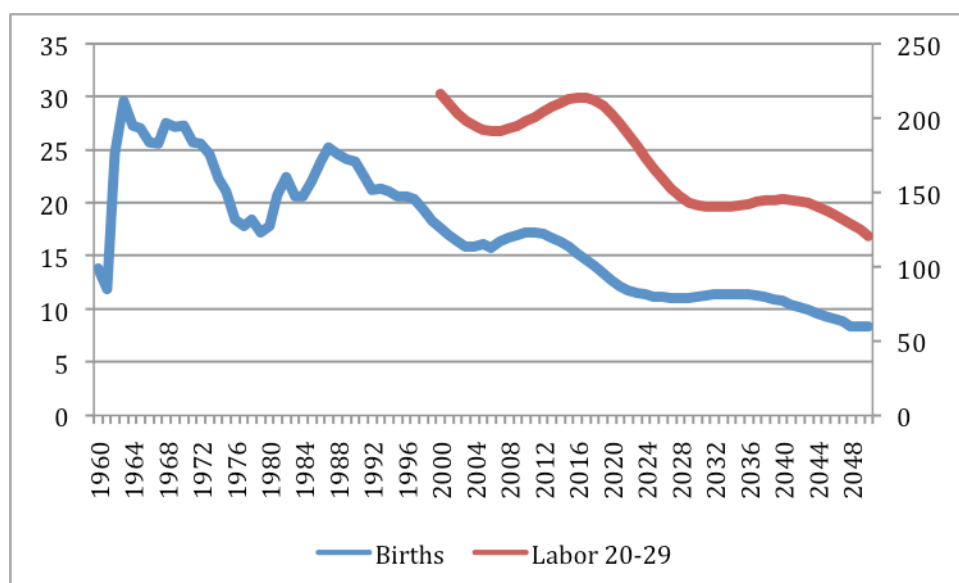


Figure 6 Declining Births, Declining Labor, China, 1960-2050



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