

## **7: Population Growth and the One Child Family**

It is impossible to understand China's economy without considering the dynamics of China's population. China has long been the world's most populous nation, and the interaction of population and resources is a long-standing part of China's economic condition. More recently, rapid demographic change has had powerful effects, both positive and negative, on the economy. China reaped a powerful "demographic dividend" during the 1980s and 1990s, and is now facing the long-run challenge of a steadily aging society. The magnitude of these effects was particularly large because the speed of China's demographic changes was unusually fast.

China's population of 1.37 billion in 2014 accounts for about 19% of world population. China's "weight" in global population has been declining gradually for four decades, from 22.5% of world population in 1974. This recent period is in fact a chapter in a long-run story. Back in the early 1800s, China accounted for around a third of world population. The shocks of the 19<sup>th</sup> and early 20<sup>th</sup> centuries had a big direct impact on population size and growth, and it was not until after 1950 that population stabilized and resumed rapid growth. China will cede its place as the world's most populous country to India around 2028, and about the same time, China's population will begin to decline. These facts will have profound implications for China's future growth trajectory.

China's recent population history contains two of the most remarkable episodes ever observed in a human population. The first of these was the famine that followed the Great Leap Forward: The largest famine of the post-World War II era, anywhere in the world; the biggest population disaster of our time. The second episode was the extraordinarily rapid reduction in birth rates beginning in the 1970s, engineered at first by strict government birth control policies. This decline was faster and more complete than the similar fertility declines that have occurred elsewhere in the world. Rapid fertility decline produced a "demographic dividend," resulting in a population today that is young and has a remarkably low dependency rate, which is favorable for growth. However, the favorable aspects of the demographic dividend have already been enjoyed, and going forward China faces three significant challenges: an unbalanced sex ratio, a reversal of the demographic dividend, and a shrinking labor force, aging population and ultimately decline in total population. These forces will slow China's economic growth, and ultimately create a significant social burden at a time when China's income is still comparatively low.

## ***7.1 The Demographic Transition and the Demographic Dividend***

### **7.1.1 Demographics in Traditional Societies**

In traditional societies, population growth rates are typically low. As noted in Chapter 2, China's pre-modern population grew for over 400 years at about 0.4% per year, which appears to be near the maximum of what pre-modern societies can sustain. Despite the fact that birth rates are high in traditional societies, population growth is slow because death rates are also high. It is common for traditional societies to have birth rates in the range of 30 to 40 per thousand, and death rates fluctuating from 20 to over 40 per thousand.<sup>1</sup> Population is in a precarious balance. When harvests are poor or diseases strike, population shrinks. Although each adult woman has many children, many die in infancy. The total fertility rate (TFR), a measure of the total number of children a typical woman bears during her lifetime, typically hovers around six (See Text Box 7-1). China remained in a pre-modern demographic pattern until after 1949. Death rates were high, and disease, crop failure, and civil war undoubtedly caused population to decline in the worst years. Between 1850 and 1950 estimated population growth was 0.3% per year, which, because of the social and economic setbacks China experienced, was even lower than the preceding four centuries. Population growth resumed after 1949, and China's first modern census, in 1953, counted 594 million people.

### **7.1.2 The Demographic Transition**

During the modernization process, population vital rates change in fairly regular ways. First, nutrition and sanitation improve and as a result population health increases. As a result of improved health, death rates decline. Infant mortality rates drop fairly quickly, as simple improvements in maternal care and nutrition take place, and a handful of deadly communicable diseases are controlled. Initially, this decline in death rates takes place without any corresponding change in birth rates. Birth rates stay high, and might even increase at first, because better fed, healthier women are more fertile. As a result, population growth accelerates. Many babies are born to each woman, and the majority now survive into adulthood, and have children of their own. Population growth rates accelerate from under 10 per 1,000 to as high as 30 per 1,000 or more, resulting in a population explosion. This type of population explosion occurred in Europe during the nineteenth century. In most parts of the developing world, however, declining death rates and the associated population explosion did not occur until after World War II. In China death rates began to decline soon after the Communist government took control in 1949. In the early 1950s rapid improvements in sanitation, more equal distribution of available

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<sup>1</sup> Demographers commonly express population changes as a ratio to one thousand. A birth rate of 40 per thousand, and a death rate of 20 per thousand imply a population growth rate of 20 per thousand, or 2 per cent.

food, and control of the most important communicable diseases began to drive death rates down. Birth rates remained high, and by the mid-1950s the population was growing more than 2% per year: China began its own population explosion.

### Text Box 7-1: Birth Rates and Total Fertility Rates

There are two rates most often used to describe fertility. The simplest is the birth rate, which expresses the number of births as a percent of the total population. This statistic has the advantage that it is easy to obtain and provides information about current population growth. Population growth equals the crude birth rate minus the crude death rate. However, birth rates are sensitive to the age composition of the population: the birth rate will be temporarily higher when there is a larger proportion of women at childbearing ages. The second rate is the TFR (total fertility rate) which is calculated in order to describe the underlying behavior of the population and understand long-run trends. The TFR is computed by first calculating the age-specific birth rate for women in a given year. That is, the birth rate is calculated separately for 18-year-old women, 19-year-old women, and so on. These age-specific rates are then aggregated to form a total birth, or fertility, rate of a representative woman as if she were passing through the successive years of her life according to the average pattern of all women in that year. Alternately stated, the TFR expresses the number of children a woman would have during the course of her life, if her fertility in each year of her life were equal to the average fertility of all the women in the population of that age during the reference year. Total fertility rates are not affected by the age structure of the population, but they are affected by changes in the timing of births. If, on average, women begin to delay births, the total fertility rate will be temporarily lowered for a period. When the total fertility rate falls below 2.1, fertility is below the replacement level, and population growth will eventually fall to zero or turn negative.

The population explosion does not continue indefinitely. Birth rates begin to decline gradually, in nearly all populations we observe. What causes birth rates to decline? One factor is that families require fewer births to reach their preferred number of children, of “target family size,” because infant survival rates increase, and because birth control technology improves. However, the more important factor is that social changes associated with modernization lead families to prefer smaller families, which translates into a smaller target family size. Social changes redefine the costs and benefits of children to the parents. As families move to cities, and as women enter the (paid) labor force, the opportunity cost of the mother's time becomes greater. The mother can contribute more to the family's income by working outside the home, rendering it more expensive to have her stay home and take care of children. Additionally, families leaving agriculture have less use for child labor. An especially important role in declining birth

rates is played by increasing levels of education, both for the mother and the children. As the child's education becomes more highly valued, families increase their target levels of education for their children. Families begin to think of children as beings that need to be supported in school, at first for five or six years, and then, later in the development process, for ten or even twenty years. As a result, the costs of supporting children through the end of the educational process become much greater. Families decide to have fewer "more expensive" children, but invest more resources in each child. An increase in the mother's level of education has a major impact, because it affects fertility through a number of different channels simultaneously. Better educated mothers have a higher outside wage, and the opportunity cost of their time is higher. In addition, better educated mothers value the child's education more, and have a better understanding of health and contraceptive issues. For all these reasons, as development proceeds, families tend to have fewer children, and then try to invest more scarce time and resources in each individual child. Some say they trade "quantity" for "quality."

As a result of falling birth rates, population growth slows down, but this process can take a long time. In the European countries that experienced clearly falling death rates by the second half of the nineteenth century, birth rates fell slowly but steadily for about a century. By the late 1970s, total fertility rates had fallen well below the replacement rate in developed countries such as Germany and Japan. Their population growth rate fell close to zero, although they continued to grow slightly, due to the combined effects of age structure and immigration. This process--from low through high to low population growth--is called the demographic transition. While the demographic transition took about a century in Europe, it has proceeded more rapidly in other countries since World War II. In East Asia, the demographic transition has proceeded particularly fast. The populations of Japan, Korea, and Taiwan have already completed a rapid transition to a low birth and death rate, low population growth equilibrium. China has also made the demographic transition under unusual circumstances and in less than twenty years.

### **7.1.3 The Demographic Dividend**

The demographic transition affects the economy most importantly through the creation of a "demographic dividend." The demographic dividend occurs because at a certain stage of the demographic transition, when the number of people of working age increases more rapidly than the population as a whole. When this happens, the dependency rate declines: that is, the share of the population that is too young or too old to work decreases, and the economy becomes more productive. The impact of the demographic dividend has been shown to be especially significant in East Asia (Mason and Kinugasa 2005). The demographic dividend emerges in a fairly predictable way from the demographic transition, because mortality reductions precede fertility reductions: falling mortality at

first produces a “baby boom.” As this baby boom matures into the work force, about twenty years later, fertility rates have begun to decline, so this age cohort has fewer children. A bigger working age group with fewer children, before population aging has begun, spells a lower dependency rate. The impact of this decline in dependency rates on the growth of GDP per capita is, in the first instance, a purely mechanical relationship. Since GDP, the numerator, is produced by workers, and the denominator is total population, GDP per capita increases when the share of workers in the total population increases. When the increase in the share of workers (decrease in the dependency ratio) is spread over two or three decades, growth of GDP per capita is higher across that entire period, until the dependency rate eventually reaches a minimum. To get a sense of the potential magnitude of this effect, just consider a simplified reference economy that shifts family structure without any other associated productivity change. If a traditional economy consisted of households with one paid worker earning 100, plus a spouse and four children, GDP per capita would be  $100/6$ , about 17. If this household instead has only two dependent children, GDP per capita is  $100/4$  or 25. If the spouse enters the labor force and also earns 100, GDP per capita increases to  $200/4$  or 50. GDP per capita triples simply due to changes in family structure and (paid) labor force participation. If this shift were spread out over 25 years, annual growth of GDP per capita would be 4.5%, without any other accompanying changes. Clearly, the “mechanical” effect of the demographic dividend on economic growth can be large. More generally, lower dependency rates imply higher material living standards for any given level of worker productivity.

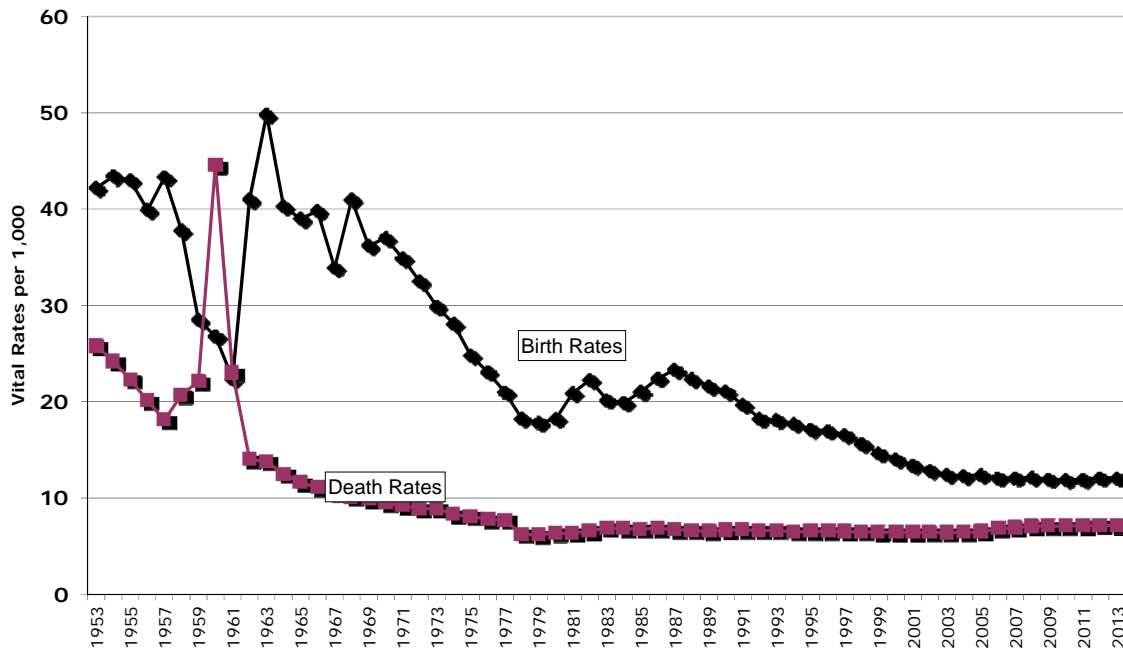
The demographic dividend has an important additional benefit through its impact on household saving. In general, individuals save while they are working, and dis-save (draw on accumulated saving) after they retire. This creates a general “life cycle” pattern of saving. (More general, consumption stays relatively constant throughout life, while income rises sharply in the 20s, then more gradually into the 50s and 60s). If a society is composed of “life cycle” saving households, then a society with a higher proportion of working age adults will have a higher aggregate household saving. This permits households to invest more directly, and make more saving available to the rest of the economy through financial institutions. Since China has an extremely high household saving rate (Chapters 6 and 18) and rapid demographic transition, this aspect of the demographic dividend seems capable of explaining a great deal. In fact, as discussed later in this chapter, the microeconomic evidence for this explanation is more complicated. Part of the answer seems to be that the “one child” policy contributes to high saving independently, and shapes the observed pattern of life-cycle saving in ways that complicate interpretation.

It should be stressed that the impact of the demographic dividend is mechanical, but not automatic. The existence of a demographic dividend depends on complementary economic policy and development outcomes. If the economy is not growing and generating jobs, the demographic dividend can become a demographic nightmare, as unemployment increases and social stability declines. However, if the economy can be launched on a positive growth path, the demographic dividend acts as a powerful accelerator of the growth process, contributing to the “miracle growth” periods described in Chapter 6. In a growing and urbanizing economy, the demographic dividend contributes to a virtuous circle of changes that support growth. With fewer children, mothers can enter the paid labor force more easily. Families invest more in the human capital of their children, despite the smaller total number (quality for quantity trade-off), leading to longer educations and higher lifetime expected incomes. Less tangibly, the young population is more adaptable and able to accept the rapid social changes that accompany fast growth, institutional change and technological transformation. As a result, only those countries that have been reaping “demographic dividends” have been able to launch full-fledged “growth miracles.”

## ***7.2 China's Demographic Transition***

China's demographic experience is shown graphically in Figure 7-1. Before we can direct our attention to the long-range trends shown by the figure, we must consider the extraordinary event shown. The most striking thing about the figure is undoubtedly the magnitude of the crisis that peaked in 1960, the final year of the Great Leap Forward. The graph shows clearly the surge in deaths in 1960 (above the otherwise clear trend of a declining death rate), and the collapse in births. As death rates soared and birth rates plummeted, China's population declined (See Chapter 3 for description). Demographers estimate the excess deaths from the Great Leap Forward by first interpolating a normal mortality curve, in which death rates would have declined smoothly between 1957 and 1962 in line with long term trends. Excess deaths equal the area under the actual mortality curve and above the normal one: by this estimate, the crisis caused about 30 million excess deaths from starvation or aggravated disease conditions. In addition, many millions of births were deferred because of the famine conditions. The massive quantities of demographic data published by the Chinese government since the 1982 census all clearly show the immense impact of the Great Leap Forward.

**Figure 7.1 Vital Rates**



We must set to one side the Great Leap Forward catastrophe in order to consider the long-run trends depicted. First, the sustained decline in death rates, aside from the Great Leap Forward surge of mortality, is quite impressive. This is not the only case of such a rapid sustained reduction in death rates in the world, but it is unusual because it occurred in such a large population that was still at a relatively low level of income. The causes were typical of sustained improvements in population health anywhere in the world: improved sanitation, water supplies and pest control and vaccination programs, combined with improved nutrition, particularly for the poorest groups. In the Chinese case, the governmental emphasis on public health and preventive medicine, combined with a large network of basic level health care workers, i.e. midwives and "barefoot doctors," made possible this substantial achievement. Life expectancy at birth increased substantially, to 66 for men (in the 1982 census) from 42 in 1950; and to 69 from 46 for women over the same period.

Birth rates stayed high from the early 1950s through 1970, fluctuating in the range of 35 to 45 per 1000 (again, leaving aside the plunge from 1959 through 1961). Indeed, birth rates were at their highest in 1963. This reflects the phenomenon of "replacement births," wherein households that had been postponing births or had lost family members during the famine years, now had an unusually large number of births as conditions improved. Overall, through 1970, China resembled most developing countries during that period. Consistently high birth rates combined with steadily declining death

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rates meant that the population was growing extremely rapidly. Population growth peaked in the mid-1960s at nearly 3% per year.

Table 7.1 Fertility decline in East Asia (total fertility rate)							
	China	Korea	Thailand	Taiwan	Hong Kong	China Urban	China Rural
1950-55	6.24	5.18	6.62	6.7	4.43	5.34	6.25
1955-60	5.4	6.07	6.42	6	4.7	5.07	5.49
1960-65	5.93	5.4	6.42	5.1	5.3	4.36	6.43
1965-70	5.99	4.52	6.14	4.2	4.01	3.37	6.51
1970-75	4.76	4.11	5.01	3.4	2.89	2.49	5.24
1975-80	2.9	2.8	4.27	2.7	2.31	1.51	4.97
1980-85	2.52	2.4	2.96	2.17	1.8	1.33	2.83
1985-90	2.38	1.73	2.57	1.74	1.36		
1990-95	1.6						
1995-2000	1.4						
2000-05	1.5						
2005-10	1.6						

Up until 1970, the trends that China experienced with respect to vital rates were rather typical. But there are few precedents for the extremely rapid decline in birth rates after 1970. Between 1970 and 1977, China's birthrate decreased by 50%. Total fertility rates dropped even more rapidly, declining from 5.8 in 1970, to 2.7 in 1978 (See Table 7-1 for period averages). We can recognize this decline as the ordinary process of the demographic transition, except that it occurred at a compressed and accelerated rate. The decline has been sustained through the 1990s, as total fertility rates declined well below the replacement rate.



## 7.2 Comparative Fertility Decline

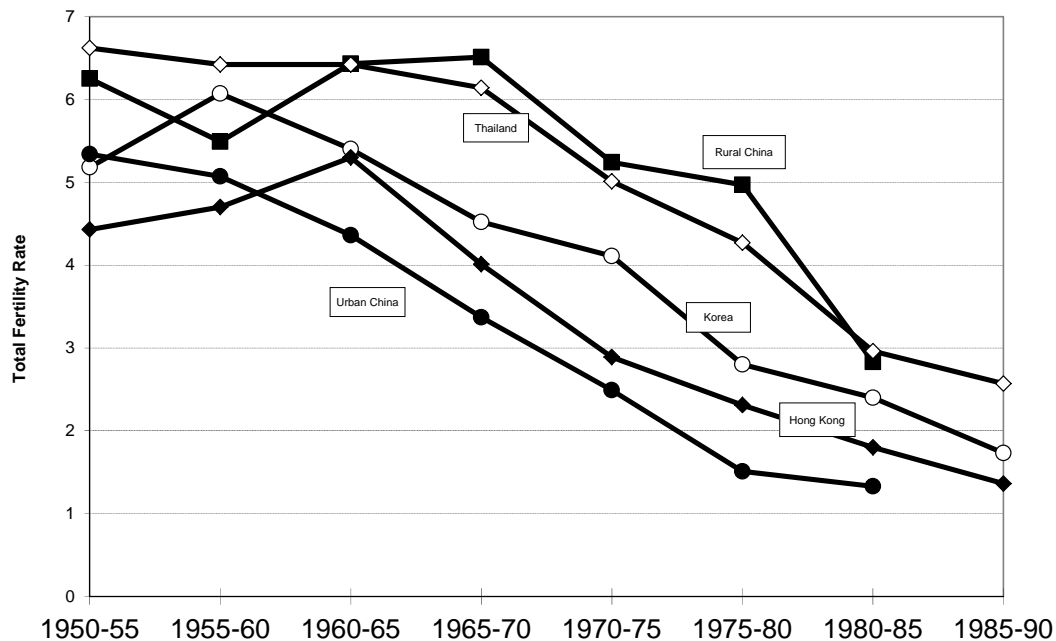


Figure 7-2 shows the comparative fertility data from Table 7-1, but combines it with separate fertility rates for urban and rural China. These data show that Chinese experience is less extraordinary than one might suppose, when placed in the East Asian context. Chinese urban fertility, to be sure, drops fastest and stays lowest of the series shown, but Chinese rural fertility is the highest. The two extremes of Chinese society thus bracket the other East Asian economies. Here again, the big gap between urban and rural society (Chapter 5) is particularly salient in China. Urban society in China has many features that are associated with smaller target family size. For a low income country, urban China displays: high female labor force participation; high female educational attainment; high educational aspiration for children; good access to health and contraceptive services; and a relatively good social security system. By contrast, rural China displays none of these features. Thus, social and institutional features strongly accentuate the basic urban-rural difference in target family size: in a rural setting, children can contribute to agricultural household income at quite a young age. Farm children care for pigs, goats, and chickens as young as 6 or 7, and start to earn their keep. Rural households have higher target family sizes, and it is not surprising to see large differences in fertility dynamics in Chinese cities and countryside.

### 7.3 The Role of Government Policy

Shortly after China's first modern census in 1953, the government initiated family planning, reflecting some alarm among population officials who began to confront the

magnitude of China's population problem. This early program was modest in scope, providing contraceptive information and services on a voluntary basis. Even this small program was abandoned in the late 1950s, though, after the personal intervention of Mao Zedong. Mao argued that China's big population was an advantage, and that human labor and creativity would allow people to wrest a living—and create a better society—despite limited resources. However, the disaster following the Great Leap Forward convinced many in China's leadership that there was a place for family planning policies, and Mao eventually allowed such policies to go forward. During 1962-1966, pilot programs of urban family planning were put in place to provide information about birth control.

Encouraged by the results of voluntary programs, the Chinese government launched its first all-out family planning initiative in 1971. This policy was known as *wan-xi-shao*, or later-longer-fewer, meaning “later marriages, longer spacing between children, and few children in total.” The legal minimum age of marriage was increased, and couples were urged to wait before having a second or third child. The policy lasted through 1978, and was directed at both urban and rural couples. This policy achieved considerable success. Both birth rates and total fertility rates fell dramatically, as shown in Figure 7.1 and Table 7.1. Virtually all the reduction in fertility was the result of fewer births of third and higher order. Through 1979, the probability of a couple having a second child, given that they had already given birth to a first child, was 95% (Feeney and Yu 1987). This could be characterized as a “Two child, but wait, Policy.”

The success of the later-longer-fewer policy was not sufficient to allay fears of a population crisis. Even with reduced fertility rates, population growth was set to accelerate as China's “baby boomers” reached marriage age. China's baby boomers were the large cohorts born during the 1962-71 period (including “replacement births” after the Great Leap Forward), and they were set to enter their child-bearing years during the 1980s and early 1990s. China's leaders worried that continued population growth would outstrip the nation's population carrying capacity and obstruct economic development. Population “hawks” argued that it was necessary to reduce fertility rates below replacement levels, at least temporarily, in order to prevent another wave of births. Only tough measures, they argued, could break the inexorable momentum of continued population growth. Policy tightened, and in September 1980, the government formally adopted the “One Child” policy and a target population of 1.2 billion in the year 2000.

The One-Child Policy seeks to convince Chinese families that the most desirable number of children is one, and it provides an array of sanctions and penalties for women who have two or (especially) more than two children. The One Child policy was immediately controversial, particularly since the implementation was extraordinarily strict through the first five years or so. In 1983, for example, policy called for mandatory

insertion of IUDs for women with one child; sterilization for couples with two or more children; and abortion for unauthorized conceptions. By 1984, domestic resistance and international controversy led the Chinese government to a substantial relaxation of the policy, which could be more aptly described as a “One and a Half Child” policy after 1984. The government officially renounced forced sterilization and forced abortion. Provincial governments developed implementing legislation that allowed second children to couples if their first child was a girl or if hardship factors were involved. The result was a significant liberalization of the policy nationwide. Moreover, since 1990, there have been further fluctuations in the strictness with which the policy is promoted nationwide.

Implementation of the One-Child Policy has been delegated to local government, and officials at the provincial level and below are evaluated, in part, on their success in lowering population growth rates in their locality. As a result, local officials are under substantial top-down pressure to control births, and they may sometimes resort to actions that contravene declared central government policy, such as coercive sterilization or abortion. On the other side, local implementation has allowed significant regional variations in the One Child policy, as provincial governments developed implementing legislation that recognized regional differences. In order to avoid charges that China was seeking to control the populations of non-Han ethnic minorities, the One Child policy was not applied to minority groups; in fact, birth rates for ethnic minorities are about double the rate of Han Chinese.

The One Child policy subjects all Chinese households to monitoring of fertility and births. This monitoring is much more intense in urban areas, where work units routinely track their female workers fertility cycles, but it also exists in rural areas. In urban areas, work units may be assigned birth quotas, and couples may sometimes have to “wait their turn” before being allowed to have even their first child. Couples who pledge to have a single child receive a “one child certificate,” that entitles them to various privileges, including preferential access to day care and schooling. After the permitted first child, couples come under various forms of pressure to limit future births.

In most rural areas, if the first child is a girl, couples are allowed to have a second child without much interference; in other areas, the original one child principle continues to be pressed with the original urgency. If a couple becomes pregnant after their allotted one or two children, they will first be subject to pressure from local family planning workers to abort the fetus. Family planning workers will visit the couple repeatedly, perhaps daily, trying to persuade them to submit to an abortion. If the couple go ahead with an unauthorized birth, they will be subject to various penalties. In most provinces, substantial financial penalties, equal to a household’s annual income or even more, are levied on families that have a third or fourth child. If families are unable to pay, their

belongings may be confiscated or their house might even be knocked down. At the same time, peasants in many areas resist the One Child policy. Births are sometimes hidden, and newly born children spirited away to be raised by relatives.

#### ***7.4 The Impact of the One-Child Policy***

The One Child policy has been controversial since its inception. Proponents described it as a necessary emergency response to an immediate surge in the population at peak child-bearing ages. Critics argued that the policy was neither necessary or appropriate; and claimed the unanticipated consequences of the policy were too severe. Despite the strictness of the One Child policy, it has never been fully successful. Even during 1983, the year of maximum strictness, 19% of total births were third order and above, and in other years of the 1980s about half of all births have been first children, and half have been second or higher order births. Partially for this reason, China's population exceeded the original target of 1.2 billion in 2000, reaching 1.266 billion in the census that year. Some demographers have argued that a more moderate policy might actually have been more effective, by continuing to provide positive incentives for families to delay births, and increasing overall compliance (Bongaarts and Greenhalgh 1985).

The one child policy involves a substantial level of coercion applied by the government against the Chinese population. Yet the level of coercion varies substantially from region to region. In large cities, the average voluntary target family size has probably dropped below the birth limits set by government policy. Chinese demographers have computed an implied policy total fertility rate for each province, which tells us what the TFR would be in that province if there was perfect compliance with policy. The lowest is Shanghai (1.28) and the highest in Xinjiang (2.4). However, thirteen provinces have actual TFRs significantly below the policy TFR, and the difference is largest in those urban and coastal areas where the policy is most strict. The biggest difference is Shanghai, which had an actual 2000 TFR of only 0.68 (Zhang Shanyu 2003: 68-71). Thus, there are significant parts of China where little coercion is required to implement the policy, and other areas where there is substantial resistance. In other provinces—especially poor, rural provinces like Guizhou and Jiangxi—fertility is significantly above what is theoretically permitted by policy. This regional variation makes clear that the One-Child Policy is not the sole, or even the main, force driving changes in fertility in China today.

Indeed, there are substantial reasons to expect that fertility would be low in today's China even without the One-Child Policy. Other parts of East Asia have experienced extremely rapid fertility decline, and the TFR is below replacement levels in Korea, Taiwan and Hong Kong. Since the 1980s, China has experienced rapid

urbanization and increases in the education levels of both sexes, along with continued high female labor force participation. These societal trends are associated with low and declining fertility everywhere in the world, and China is unlikely to be different. Indeed, there are even “experimental zones” within China where the One-Child Policy was never applied; those “zones” have also experienced rapid reductions in fertility. Reflecting on a regional comparison and other data, Cai (2010: 434) concludes:

China’s drive to below-replacement fertility might have been jump-started and accelerated by a heavy-handed government policy, but policy is not the key factor behind the very low fertility that has emerged. ....Socioeconomic development plays the decisive role in the transition to below-replacement fertility in China as it does in other societies.

It seems obvious that the One-Child Policy has outlived its usefulness, if indeed it was ever useful. Increasingly, the question is asked, “why has the One-Child Policy *not* been ended already?” In November 2013, the Third Plenum meeting announced that the One-Child Policy would be relaxed. Implementation is in the hands of provincial governments, and during the first year following the policy’s announcement, relaxation had begun, but at an extremely cautious pace.

#### **7.4.1 Under-reporting of Births Due to the One-Child Policy**

The coercive element of the One-Child Policy evokes a defensive response from Chinese families, especially in rural areas: they under-report births, especially births of baby girls. Rural families and rural officials have no incentive to report births accurately, and strong incentives to delay reporting or not to report at all. Then children can sometimes be gradually streamed into society, bending the rules and evading punishment. Of course, this is especially true for girl births. The most striking evidence for incomplete birth recording is that successive censuses routinely discover more children aged 10-12 than there were children reported born in the previous census, ten years before. For example, 12% *more* ten-year-olds were recorded in the 2000 census than new-borns in the 1990 census, and similar results were reported in the 2010 census. More careful census enumeration procedures have been offset by the difficulties of tracking an increasingly mobile population.

The result is that all official demographic statistics are made inaccurate by the under-reporting of births. According to Wang Feng (2005), the One Child Policy has led to “the collapse of a credible government birth reporting system.” Gradually spreading recognition of this fact means that today even official sources recognize the flaws in birth reporting and make corrections for them. Over the long run, the quality of demographic data is good enough that demographers can largely correct for these omissions, after

discussion and debate. However, in the short run, they add a significant element of uncertainty to every aspect of Chinese demography. For example, the initial calculation of the TFR based on the 2000 census was only 1.22, implying a reduction in fertility that was so fast that it really was not believable. Officials in the birth planning agency and the Statistical Bureau decided that this result was due to an increase in the number of hidden births and *increased* the estimated correction they made, deriving a “corrected” figure of 1.7 (from graph in Cai, verify). Independent demographers in turn criticized the “corrected” figure for being too high, and further data from the 2010 census has largely established that China’s TFR in 2000 was about 1.5. The over-correction of the official figure reflected an unwillingness to acknowledge the speed of China’s fertility decline, perhaps due to a desire to defend the continuing need for the One-Child Policy.

These data problems reduce the certainty with which pronouncements about current behavior can be made. The uncertainty has made it easier for policy-makers to delay relaxing (or abandoning) the One-Child Policy. Moreover, the under-reporting of births has obscured a recent public health achievement about which the Chinese government should have reason to publicize. Use of the official birth numbers leads to inaccurate and under-stated figures for infant and child mortality (since there are even stronger incentives not to report stillbirths or birth of sickly children). Thus, unadjusted official data on infant mortality and life expectancy at birth are not at all credible or useful. Moreover, the adjustments to correct for under-reporting are even more sensitive to specific assumptions than the adjustments for TFR. However, careful adjustment by independent demographers indicates that China’s life expectancy at birth, after increasing rather slowly between the 1982 and 2000 censuses, increased briskly in the first decade of the twenty-first century. Cai (2013) shows life expectancy at birth increasing from 69.7 to 74.1 for men, and from 72.8 to 77.4 for women between 2000 and 2010. This increase of 4-5 years in life expectancy within a decade, while not completely unprecedented in international experience, is a strongly positive result. In related fashion, infant mortality, according to unadjusted census data, is a not credible implausibly low 4.4 per thousand. In this case, the National Bureau of Statistics makes an adjustment to 13.6 for males and 14.3 for females, still a very good result. Thus, the One Child-Policy distorts the data on which good policy-making should be based, and obscures China’s public health achievements. These data problems must also be kept in mind during the discussion of three major demographic trends below: unbalanced sex ratios; the “demographic dividend,” and rapid population aging and population decline.

### **7.5 Unbalanced Sex Ratio**

The most important unanticipated impact of the One-Child Policy is the unbalanced sex ratio due to the Chinese preference for sons. The traditional cultural preference for boys is sustained by the marriage system. Girls “marry out” leaving their home village, while boys remain in the village and often stay in the family homestead. Boys are thus more likely to contribute to the household’s income and support the parents in old age. Girls, while they may be willing to help, are at the very least some distance away, bound to a new family, and with fewer resources and less ability to assist aged parents. Thus, boys are culturally and materially more valuable to many peasant households than girls. When this preference for boys collides with government-enforced birth limitation in China, the result is an extremely unbalanced sex ratio.

**Table 7-2: Sex Ratio at Birth (Males per 100 Females)**

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1953	104.9
1964	103.8
1982	107.6
1990	111.8
1995	116.6
2000	117.8
2006	119.3
2010	118.6

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Population Census Office, as reported in Cai and Lavelly (2003): 15;  
2006 and 2010 from Peng Xizhe (2012).

In most populations, more boys than girls are born. The average ratio is 106 boys for every 100 girls, with some normal variation, such that anything between 103 and 110 might be considered within the normal range).<sup>2</sup> In traditional China, female infanticide dramatically skewed this ratio. In the late 1930s, there were more than 120 boys for every 100 girls. Economic and social progress after 1949 brought this imbalance steadily down, so that during the 1960s and 1970s, the sex ratio was well within the normal range (Table 7-2; See Coale and Banister 1994). However, since the early 1980s, the sex ratio has risen steadily and steeply. In the 2010 census, the relative number of boys per 100 girls at birth was 118.6, clearly outside the normal range.

The sex ratio data also suffer from the under-reporting of births discussed in the previous section. Some of the “missing” girls are in fact “hidden girls.” Careful

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<sup>2</sup> In most populations, boys experience slightly higher mortality rates than girls, such that the sex ratio tends to equalize as groups reach reproductive ages. In old age, women outnumber men in China as in other societies.

demographic detective work indicates that about one-quarter, and perhaps as much of one-third, of the unbalanced sex ratio at birth can be explained by selective under-reporting of female births (Cai and Lavelly 2003; Cai 2012). Thus, under-reporting cannot fully explain un-balanced sex ratios, which have also risen in urban areas where surveillance is much tighter (Zhang Yi 2004). Instead, the most important factor probably is the availability of sex-selective abortion. Since the early 1980s, ultrasound machines, which can determine the sex of the baby *in utero*, have become widely available throughout China, including the countryside. While it is technically illegal for ultrasound technicians to reveal the gender of the fetus, such regulations are easily evaded. Indeed, diffusion of ultrasound machines has been associated with worsening gender imbalances in many Asian societies. Under pressure to limit the total number of births per family, many Chinese families appear to make the choice to limit those births to more highly valued male children. Adding to the problem is the fact that mortality rates for girls are higher than those for boys, a pattern that is again in sharp contrast to that normally observed in other societies.

### 7.5.1 “Excess” Male Population

The unbalanced sex ratio directly reflects discrimination against female children. The imbalance also creates hardship for males, especially through the operation of the “marriage market.” Traditionally, virtually all Chinese women eventually married. Even today, more than 99.5% of women aged 45-49 currently are or previously have been married, and 97% of males (2010 Census: p. 1862; this cohort was born in the early 1960s, before the unbalanced sex ratio developed). With a norm of nearly universal marriage, the unbalanced sex ratio implies, by simple arithmetic, that millions of males will be unable to marry. Since the early 1990s, there have been about a million more males than females born every year, implying a “bachelor problem,” an excess of males in the marriage market who will never find wives, approaching twenty million in total.

Since women marry “out,” and aspire to marry “up,” the imbalance implies that men with the lowest income and social status will be unable to find wives. Since women can migrate to make a better marriage, surplus males will be concentrated in rural areas, and especially in poverty-stricken rural areas. Indeed, poor villages with disproportionate numbers of unmarried males—“bare branch villages”—have already been publicized in Chinese media. It is argued that discontented males in this position may be more prone to criminality and other social problems. In any case, the problem will get worse before it gets better. This is true in part because of the gradual accumulation of unmarriageable males. A more fundamental cause, however, is that the gradual onset of zero population growth changes the dynamics of marriage markets. Since males typically marry females a few years younger than themselves, the problem of surplus males is less severe when the population is growing, since there is a larger pool



of eligible females for a male at any given age. However, after 1990, the size of birth cohorts has declined, so the pool of marriageable females is now shrinking. According to Jiang et al (2011), the imbalance in marriage markets will become much more severe up until 2025, as this population growth effect comes into play at the most marriageable ages. The evolution after that depends on whether the imbalanced sex ratio at birth can be corrected.

### **7.5.2 Further Consequence of the Unbalanced Marriage Market**

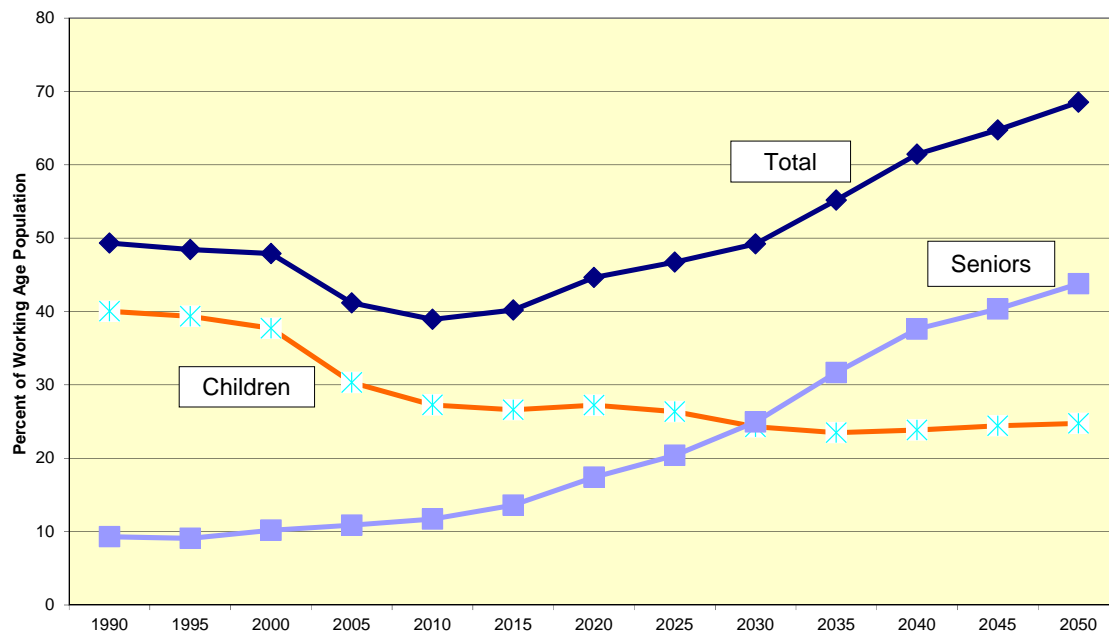
The unbalanced marriage market has further economic and social implications beyond the frustration of underprivileged males unable to marry. There is intense competition among males for the most eligible females. Wei (2012) shows a correlation between household saving rates and the sex imbalance across different regions in China. He argues that sex imbalance pressures males to accumulate saving and (often) purchase an apartment, in order to demonstrate their value in the marriage market. Parents and other family members may also contribute to this accumulation of assets. In this argument, sex ratio imbalance is one of the drivers of China's extremely high household saving ratio (Cf. Chapter 6). A similar effect may be at work in another unusual phenomenon observed in China's marriage market. A country undergoing the kind of social changes China is experiencing typically experiences a narrowing of the age differential between male and female in first marriages. Indeed, this was the Chinese experience through the 1990s. However, since the mid-1990s, the age gap at first marriage has increased again, which is quite unusual. Some argue that the need to demonstrate financial stability in a highly competitive marriage market favors older husbands and drives this social change.

### **7.6 Changing Age Composition of the Population: The Demographic Dividend and Its End**

The current age structure provides a window of opportunity for China's economy: China has the advantage of a young population with low dependency rates. That is, both young and old dependents represent a relatively small share of the population. In 2010, 74.5% of the population was between the ages of 15 and 64 (compared with an average of 61.5% for all middle-income countries). Figure 7-3 shows the dependent population expressed as a percentage of the population of working age (15-64), that is, as a "dependency rate," between 1990 and 2050. It shows that China's dependency rate is extraordinarily low during a trough between 2005 and 2015, that is, right now. (In fact, the actual dependency rate is today slightly below that shown in Figure 7.3, because fertility has already declined faster than projected for this figure). This is because China's baby boomers, born in the 1960s, and even the following "baby boom echo," born in the late 1980s, are now mainly in the work force. Assuming consistent fertility

and mortality rates, population trends can be extrapolated into the future. The youth dependency rate (number of children) is now dropping sharply, because of the effect of the draconian birth control policies described in this chapter. At the same time, older dependents (65 and up) are not yet a large segment of the population, because China has emerged from poverty so recently and the decline in death rates that began in the 1950s is only now leading to an increased share of the elderly.

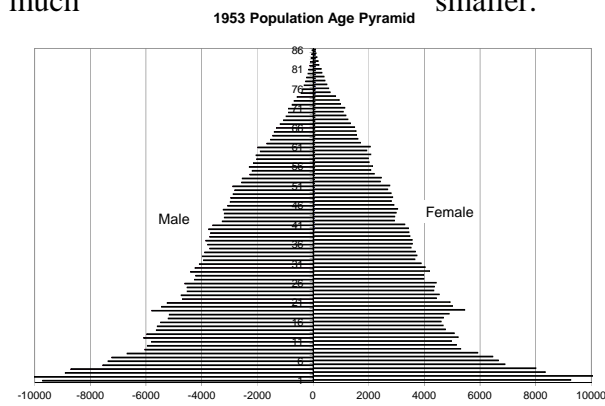
**Figure 7.3 Dependency Rates**



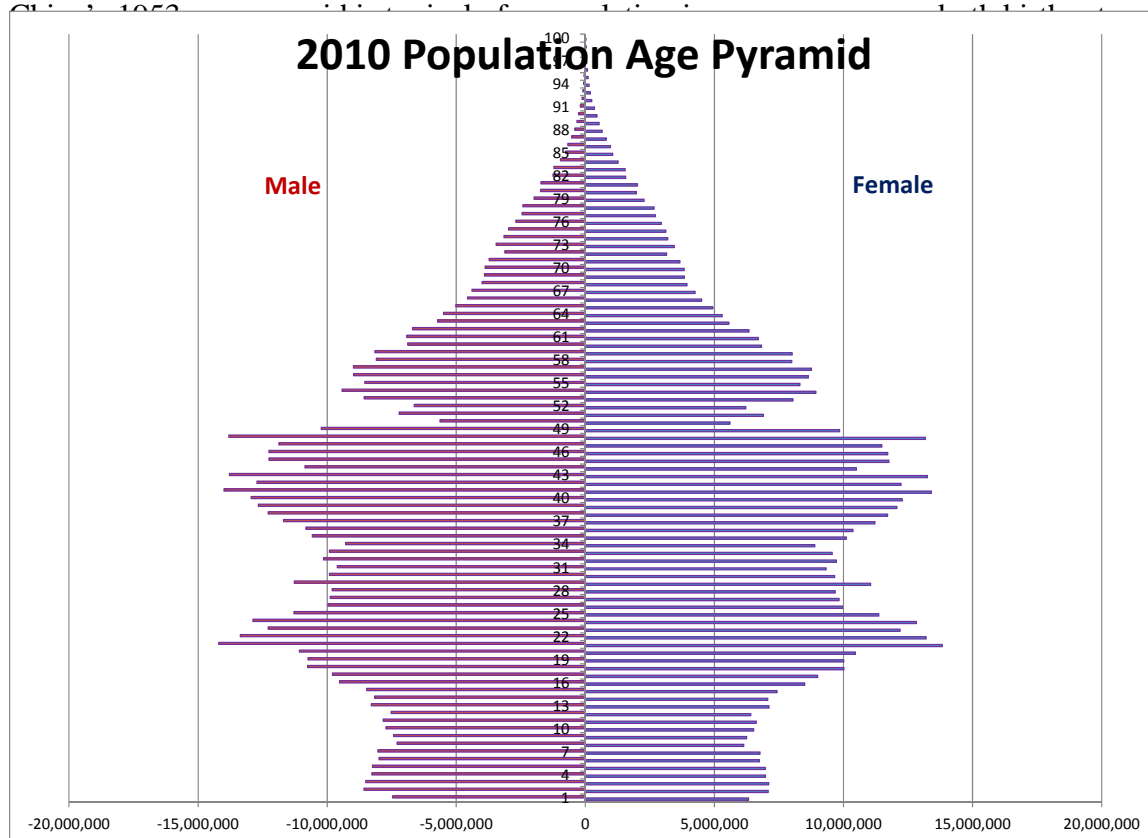
### 7.6.1 The Reversal of the Demographic Dividend

### 7.7 Population Aging and Population Decline

The persistence of fertility and mortality rates combines with the existing structure of the population to produce predictable patterns of change of the labor force. During the 1980s and 1990s, the working age population grew extremely rapidly, and of course significantly more rapidly than the population as a whole. During the 1980s, the working age population grew 2.5% annually. Moreover, population growth combined with rural-to-urban migration to fuel an even more rapid growth of the urban labor force, which has grown at above 4% per year since the 1980s. However, as Table 7-3 shows, the growth of the labor force is now beginning to slow substantially. The labor market is just now absorbing the last huge birth cohort (the “baby boom echo” born in the late 1980s), and future cohorts of young people entering the labor force will be those born since the 1990s, when birth control policies had fully taken hold and size of birth cohorts much smaller.



These changes have predictable effects on the population and labor force, mediated through the age composition of the population. Figure 7.4 shows an age pyramid of China in 1953. The pyramid is stacked from youngest to oldest, with the width of the horizontal line showing the size of the age cohort of that year.



### **FIGURE 7.5**

Figure 7.5 shows China's age pyramid in 2010. The shape is very different from a traditional age pyramid, and shows clear evidence of the dramatic events that have shaped China's population history. The "indent" at age fifty shows the impact of the Great Leap Forward, reducing births and raising infant mortality around 1960. Even more striking is the sharp decline in cohort sizes below the age of 20, that is, after 1990. The narrowing of the base sharply displays the impact of declining fertility. The age pyramid can be thought of as moving upwards year by year. Change in the size of the labor force depends on the size of the young age cohorts entering the labor force and the older cohorts retiring from labor. From Figure 7.5, it can be seen that China is poised for a prolonged period of declining labor force size. In fact, 2012 was the first year to see a decline in the size of the population between the ages of 15 and 64.

Given the existing age structure and assuming that age specific fertility rates remain constant, growth of the working age population will drop off quickly and reach zero growth after 2015. Once labor force growth drops to zero, the only source of growth of the modern labor force will be migration from agricultural employment. Table 7-3 is constructed with the assumption that rates of rural to urban migration will remain constant. Under this assumption, the rural labor force will begin to shrink in size rapidly, while the urban labor force will maintain slower growth for another two decades. Slower urban labor force growth may reduce some of the pressure on urban employment, while still allowing a robust process of structural transformation to continue at least until 2020 or so. Slower growth of the urban labor force will almost surely be associated with slower overall GDP growth as well. If growth of the urban labor force drops by three percentage points between 2005 and 2025, GDP growth might also be expected to slow by a roughly similar magnitude. Demographically, the years from 1990 to 2025 represent a window of opportunity, which is extremely favorable for China's economic growth.

Later on, an aging population will create substantial strains on China's social system. Rapid aging will require effective response as the social structure of the country will place greater burdens on the economic sector. It is estimated that the number of Chinese over 60 years old will increase from 128 million in 2000 to 350 million in 2030. This increase means that in 2030 the elderly will make up approximately 20% of China's population. Rapid population aging essentially echoes the earlier declines in fertility and

mortality. In China's case, the impact of the rapid decline in fertility is amplified by the mandatory retirement (beginning at age 60 in many sectors) of the eldest baby boomers, which will begin around 2015.

China's aging is rather similar to that of other East Asian populations. In 2000, China still had a small share of its population 65 and over, only 6.8%. By 2050, China will join the ranks of six populations which will have an elderly share over 20%:

**Table 7-4: Percentage of Population Age 65 and Older**

	<b>2000</b>	<b>2050</b>
Japan	17.2	37.8
Korea, Republic of	7.3	34.2
Singapore	7.2	32.6
Hong Kong	11.0	32.6
Taiwan	8.1	25.9
China	6.8	23.3

Today, of course, China's income is substantially below that of the other five. By 2050, China's senior share will slightly surpass that of the US (21.6%).

Currently, most elderly in rural areas primarily rely on their children for financial support, as do a significant minority of urban elderly (Table 7-4). Males are much less likely to be dependent on their children than are females, reflecting higher (formal) labor force participation, more generous pensions (in cities), as well as greater female longevity. Whether or not the elderly are financially dependent on their children, most live in the same household with them. In rural areas, only 9% of those aged 60 and over do *not* live in multi-generational households, while in urban areas the figure is 26%.

**Table 7-3: Growth of Working Age Population**

	<b>Average Annual Rates</b>		
	<b>National</b>	<b>Rural</b>	<b>Urban</b>
<b>1982-1990</b>	<b>2.5%</b>		
<b>1990-1995</b>	<b>1.7%</b>		
<b>1995-2000</b>	<b>1.4%</b>		
<b>2000-05</b>	<b>1.6%</b>	<b>-0.1%</b>	<b>4.1%</b>
<b>2005-10</b>	<b>1.0%</b>	<b>-0.9%</b>	<b>3.2%</b>
<b>2010-15</b>	<b>0.5%</b>	<b>-1.6%</b>	<b>2.5%</b>
<b>2015-20</b>	<b>-0.1%</b>	<b>-2.4%</b>	<b>1.6%</b>
<b>2020-25</b>	<b>0.0%</b>	<b>-2.3%</b>	<b>1.5%</b>
<b>2025-30</b>	<b>-0.2%</b>	<b>-2.8%</b>	<b>1.1%</b>
<b>2030-35</b>	<b>-0.7%</b>	<b>-3.8%</b>	<b>0.6%</b>
<b>2035-40</b>	<b>-0.8%</b>	<b>-3.9%</b>	<b>0.3%</b>
<b>2040-45</b>	<b>-0.5%</b>	<b>-3.5%</b>	<b>0.3%</b>
<b>2045-50</b>	<b>-0.6%</b>	<b>-3.6%</b>	<b>0.0%</b>

Projections by US Census Bureau, International Division

Through 2000, SYC 2005: 188.

Indeed, children are legally obligated to care for their parents in their old age. This traditional reliance on children will face severe strains as a result of China's declining birth rate. By 2030, the average 65-year-old urban dweller will have only one child, and the average rural resident of that age only 2.3 living children.

Given current fertility trends, the aging of China's society will continue for a long time. Dependency rates would ultimately peak in 2065 with the total number of elderly amounting to 54% of the working age population. It would be very difficult to support such a large elderly share of the population. Rural and urban areas both face difficult challenges in dealing with future aging. Rural areas are arguably at a disadvantage. Rural elders are usually not covered by the pension plans that are commonplace in urban areas, have a lower overall income, and will have higher dependency rates caused by the outflow of working age youths to urban areas. These three factors result in the rural elderly being more dependent than urban elderly on their own income and financial transfers from their children. In the cities, however, most workers enjoy some kind of promised pension after they retire. However, until the early 1990s, all of China's pension liabilities were unfunded, meaning that the pensions of currently retired persons were paid from the tax payments of current workers, and nothing had been set aside for future retirees. Since the 1990s, the Chinese government has struggled to set up a functioning and funded pension system, and reforming the pension system has become an important issue. In this respect, China resembles many other countries that are struggling with the implications of population aging for social security and pension programs. But there is one important difference. Most of these other countries are developed countries that grew rich first, and then grew old. China will grow old before it has had the opportunity to grow rich.

## **7.8 Conclusion**

The One Child policy has shaped China in many important ways, and has had important impacts on its economic development. The One Child policy forced China through the demographic transition at an accelerated pace, and created an exceptional demographic window of opportunity for growth during the reform era. At the same time, the One Child Policy is responsible for the exceptional severity of problems that will challenge policy-makers in the immediate future. The One Child policy will cause the number of retirees and the future elderly dependent ratio to increase particularly quickly, exacerbating future demographic strains. The One Child Policy has led to serious gender imbalances that may ultimately lead to discontent and further problems

Overall, demographic conditions in China are shifting dramatically just as this edition is being written. Chapter 8 will explore some of the labor force implications of these changes. What is clear, however, is that the demographic advantages China has

enjoyed over the past twenty years are now over: slower labor force growth and an aging society are the prospect for the foreseeable future. However, this change also brings with it the possibility that the One Child-Policy will be finally abandoned, and that Chinese citizens will be able to voluntarily choose a more diverse and satisfying set of family arrangements.

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