

The Economic Consequences of China's One Child Policy

By Sam Hansen

Abstract

In the aftermath of the Mao-era, China enacted the one-child policy to curb its staggering population growth and mitigate the associated consequences of poverty, resource-depletion, pollution, and urban sprawl. Though it dramatically reduced China's fertility rate, the policy had many unforeseen consequences such as a gender gap of 30 million more men than women, forced abortions, and increased crime rates (Brooks 1). While the one-child policy was justifiable in 1979, its continuation will increase China's elderly dependency ratio in the future and stifle innovation in the workforce. Ultimately, such factors will reduce China's global competitive edge and suppress its future economic growth. Therefore, China must gradually loosen the one-child policy while balancing the risks of excessive population expansion.

The One Child Policy: Why does it exist, and how does it work?

When Chairman Mao Zedong came to power in 1949, he launched a national campaign to expand the Chinese population under the slogan, "The more people, the stronger we are" (Potts 361). Mao believed that a large population would lead to more production and a stronger military (Hays 1). In turn, the communist government banned contraceptives and promoted fertility through widespread propaganda (Fitzpatrick 1). Despite Mao's conviction that "Even if China's population multiplied many times, she [was] fully capable of finding a solution" (ibid.), the country faced widespread food shortages and an unsustainable fertility rate of 5.8 children per woman by 1962 (Schure 1). By the end of Chairman Mao's rule, the population had more than doubled (Hays 1).

Mao's successor, Deng Xiaoping, sought to mitigate China's population explosion as part of his "Reform and Opening" initiative by creating the one-child policy in 1979. The policy operates on a simple principle: If a family has more than one child, the husband and wife must each pay a "social maintenance fee" – which

varies depending on the region. For instance, a couple in Shanghai could expect to pay RMB 110,000 (\$17,300) for another child, which is triple the city's average yearly income ("The Brutal Truth" 1). The social maintenance fee is often lower in poorer provinces, but still exceeds the annual incomes of average residents (Hays 1).

For families who cannot afford the fine, the second child is denied a household-registration document known as a *Hukou* – which is used to obtain education, employment, and other basic needs (Congressional-Executive Commission on China 1). In this way, families who violate the one-child policy face a choice between paying a crippling fine and rearing a child without social benefits. However, since the policy was enacted, the national government has made exceptions for the following groups of people ("Rethinking China's One-Child Policy" 1):

- Couples in rural areas whose first child is a girl
- Urban couples who both come from single-child families
- Ethnic minorities

In addition to these general exemptions, individual provinces allow a wide range of exceptions to the policy. For instance, Shanghai exempts couples in which one spouse has worked in the fishing industry for over five years ("The Brutal Truth" 1). In Sichuan province, where the devastating 2008 earthquake occurred, families who lost their children are allowed to have a second child (Hays 1). Additionally, because the requirements and enforcement of the policy vary from province to province, personal connections and bribery often serve as loopholes to the policy as well ("The Brutal Truth" 1).

The Increasing Elderly Dependency Ratio: Why is it Happening?

China's increasing Elderly Dependency Ratio (EDR) is driven by its shrinking workforce and rising number of elderly dependents. A country's EDR is determined by the following formula: $EDR = \frac{\text{Population } 65+}{\text{Population } 15-64} \times 100$, which approximates the ratio of retirees to workers (Chiu 25).

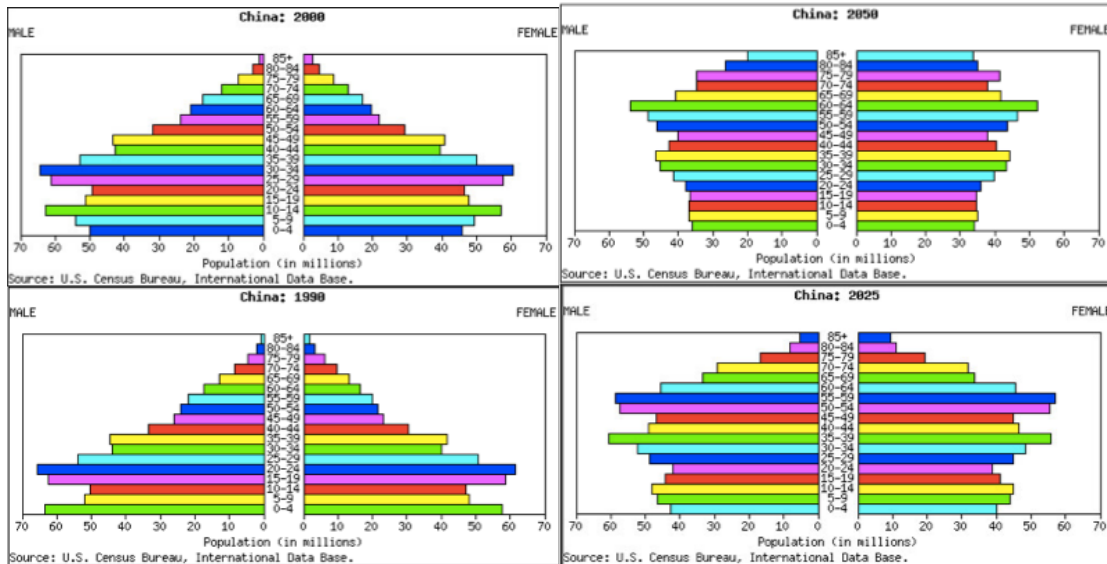
As depicted in the population pyramids in Figure 1, the number of Chinese people over 65 is projected to double between 1990-2050 (Ibid.). The population

pyramids for 1990 and 2000 represent large young populations who supported small old populations. However, the pyramids between 2025-2050 are “top-heavy” with elderly dependents, indicating that older populations will outnumber younger ones. In turn, the proportion of old to young people is expected to quadruple China’s EDR by 2050 (“China’s Achilles Heel” 1). This demographic shift will occur if China’s fertility rate remains so low that it cannot keep pace with elderly population growth. Figure 2 represents the growing number of elderly dependents within China’s population, which is based on current projections of fertility rates, mortality rates, and life expectancy in China (Chiu 18).

However, as life expectancy in China increases in the future, the retirement age could rise as well. For instance, if the retirement age rises to 70 years of age, seniors will remain in the workforce longer. Under this scenario, the EDR formula should be recalibrated to include the population of people over age 70 divided by the population between ages 15-69: $EDR = \frac{\text{Population } 70+}{\text{Population } 15-69} \times 100$. On one hand, allowing seniors to retire later would create a larger workforce and reduce the number of elderly dependents. On the other hand, seniors who remain in their jobs longer will create a bottleneck to employment for young laborers seeking to enter the workforce.

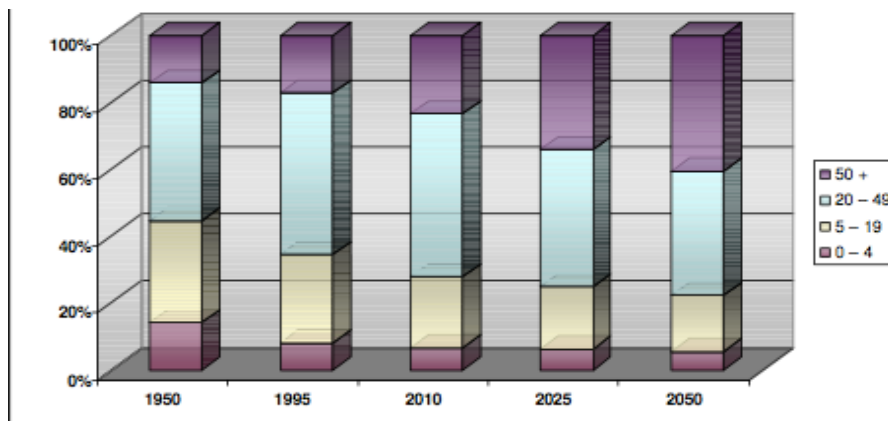
Additionally, increased life expectancy is not necessarily correlated with increased productivity. As people age, impaired cognitive functions and various health ailments can hinder the ability of workers to be productive. In this way, the demographic changes depicted in Figures 1 and 2 indicate that China’s large elderly population will pose economic risks even with increased life expectancy.

Figure 1: Population Pyramids for China: 1990, 2000, 2025 and 2050



Source: Chiu 19-20

Figure 2: Changing Age Distribution of China's Total Population, 1950-2050



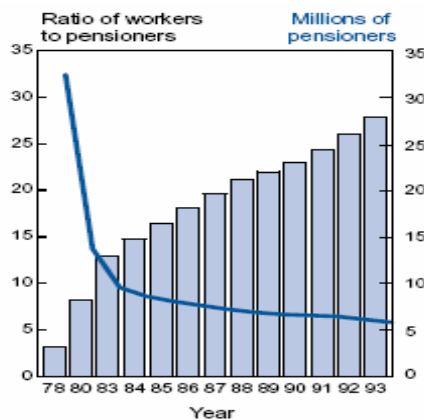
Source: Chiu 18

China's changing age distribution in Figure 2 is the direct consequence of restricted fertility under the one-child policy. China's fertility rate in 2010 was 1.56 live births per woman – which is significantly less than the 2.0 “replacement rate” needed to maintain a fixed population level (“China's Achilles Heel” 1). Ultimately, China's fertility rate will shrink the size of upcoming generations. In this way, the one-child policy is a double-edged sword; it creates an overabundance of old people and reduces the supply of young workers.

The Consequences of an Elderly Population

China's burgeoning elderly population will put an economic burden on the labor force, strain China's federal budget, and slow its economic growth. Figure 3 compares the declining ratio of workers to pensioners with the rising number of pensioners in China (Chiu 29). Although the timeline in the figure ends in 1993, the ratio of workers to pensioners has continued to decrease, and China has expanded its pension program to include 150 million rural retirees, who receive monthly pensions of RMB 55 (\$8.80) (Ibid.)

Figure 3: Ratio of Workers to Pensioners in China, 1978–1993



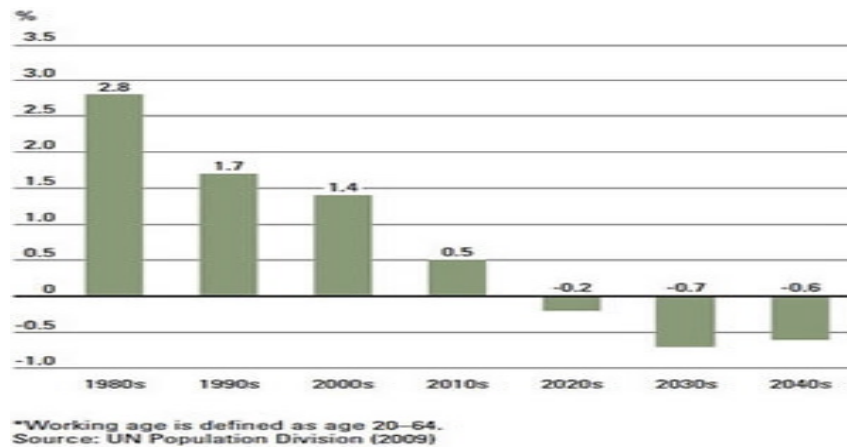
Source: Chiu 29

Figure 3 suggests that workers will be forced to sacrifice more time and money to support the elderly because fewer working-age people are required to care for more retirees. In the absence of a comprehensive social security system, each only child is responsible for themselves, their two parents, and their four grandparents – a trend of filial piety known as the “4-2-1 phenomenon” (“China’s Achilles Heel” 1). While some social safety nets exist, only 365 million people out of 1.3 billion have formal pensions (Ibid.) In turn, most families – especially those in rural areas – largely rely on their children to take care of them in old age. Such responsibilities detract from worker productivity because of the extra time and money they must spend caring for their elders. However, because many workers are unable or unwilling to do so, the Chinese government has recently stepped in to meet the needs of the growing retiree population by spending larger portions of the national budget on healthcare, pensions, and other benefits (Hamlin 1).

While such investments may relieve workers of their familial duties, they will

come at the expense of higher taxes and reduced investment-led growth. A report by the Brookings-Tsinghua Center for Public Policy found that failure to reform the one-child policy could cut China's growth by 50% due to rising social benefit liabilities and decreasing labor productivity (Ibid.). Unless reforms to the policy are made, the shrinking workforce, depicted in Figure 4, will slow future GDP growth.

Figure 4: Average Annual Growth Rate of the Working Population, 1980-2040



Source: Jackson 1

Additionally, with fewer workers contributing to social security funds, China will face large unfunded pension liabilities. Currently, China's unfunded pension liability stands at 150% of GDP, which is expected to increase in the future ("China's Achilles Heel" 1). In this way, China's expanding elderly population will place immense burdens on workers, the government, and the national economy.

Stifled Innovation in the Workforce

In coming decades, China's workforce will not only become smaller, but also less innovative. Two main factors will stifle innovation: China's memorization-based education system under the *Gao Kao* – the national college entrance exam – and the tendency of the elderly to become less creative as they age.

The *Gao Kao*

At the end of high school in China, students must take a college entrance exam known as the *Gao Kao* – or the "Big test." The 9-hour exam is only offered once a year, and is the sole determinant of college placement. High scorers are placed into elite universities and have little trouble securing successful jobs, while low scorers often face dismal employment prospects (Sudworth 1). The studying process, which

often begins years before the test, mostly involves rote memorization, repetition, and fact cramming (Ibid.). In turn, few opportunities exist inside or outside the classroom that foster critical thinking, creative problem solving, and individual expression. For many students, the *Gao Kao* is their sole chance to ascend the social ladder, so creativity and innovation – which are not tested on the exam – are afterthoughts for both students and teachers. For instance, according to a recent study on innovation in the Chinese classroom, “Teachers are encouraged to promote creativity in the classroom, yet many studies indicate that they do not like creative students” (Kwang and Smith 308). In this way, the memorization-based education system is a bottleneck for upcoming generations of innovators.

Young Graduates

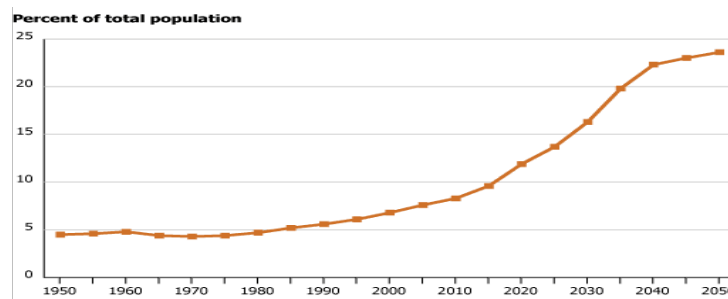
The consequences of hampered innovation extend beyond the high school classroom and into the job market. When students graduate from college, many are now seeking government employment instead of careers in the private sector – where most entrepreneurial ventures, patents, and startups are hatched (“The Golden Rice-Bowl” 1). Over the past ten years, the number of people taking the civil service exam – which determines government employment – has increased twentyfold, indicating dissatisfaction with private sector employment (Ibid.). Although this uptick can be largely attributed to the more comprehensive benefits of a government job, it also reflects worker discouragement from pursuing private sector career paths. As top graduates choose to work for the state, private industry may suffer a brain drain, which has negative implications for the development of new companies and products.

The Elderly

As fewer innovators enter the workforce, more of them will leave it as well. Stanford University Professor James Liang, an economist and chairman of Ctrip.com, argues, “In pretty much every country, developing and developed, you see that the older the age of the workforce, the lower the overall entrepreneurship” (Roberts 1). Indeed, as current workers reach old age, they generally become less able to develop new solutions to new problems. According to Professor Liang, this is precisely what happened to Japan’s economy; as “Japan’s workforce aged,

innovation and entrepreneurship suffered and contributed to the country's economic stagnation" (Langfitt 1). Since the number of people over 65 is expected to rise to nearly 25% of the total population by 2050, China will lose large portions of current innovators as they reach retirement (see Figure 5 below).

Figure 5: Percentage of Older Adults (Age 65+) in China, 1950-2050



Source: Kaneda 1

The Chinese government has taken some steps to promote indigenous creativity by promoting “cost innovation” – which involves developing cheaper versions of preexisting technologies and products (Johnson and Weiss 66). However, it has failed to tackle the underlying causes of restricted creativity such as education reform and strengthening intellectual property laws. For instance, in 2006, Chinese citizens accounted for only 40% of the invention patents granted in China; the rest were given to foreigners (Ibid.). This patent gap is largely because China’s manufacturing economy is based more on imitation than innovation (“Imitate or Die” 1).

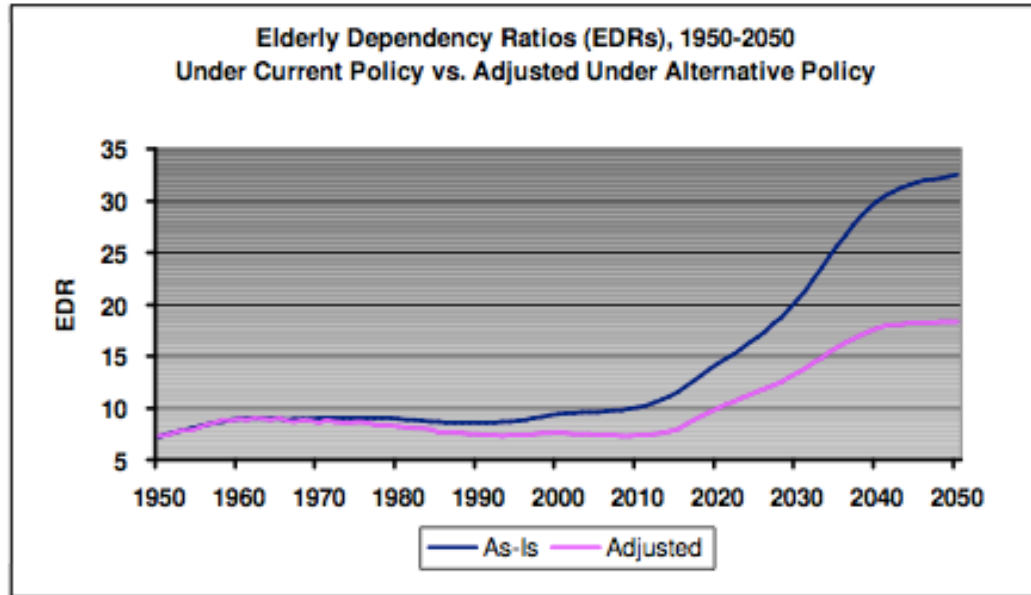
Conclusion

Without reform to the one-child policy, China’s Elderly Dependency Ratio will rise to an unsustainable level, and its workforce will likely become less innovative. If China relaxes the policy by allowing more exceptions or reducing penalties, it can restore its fertility rate to a level necessary to begin rebalancing the growing divide between young and old. In turn, more working-age adults will be able to care for the vast elderly population by sharing the financial cost of increased taxes, as well as the productivity cost of time spent caring for elderly relatives.

Figure 6 – which is based on United Nations population projections in China – shows the anticipated effect of allowing a two-child policy on China’s Elderly

Dependency Ratio. Because such a policy would add to China's working population, it would decrease the country's EDR and mitigate the associated consequences of an elderly population (Chiu 46).

Figure 6: Elderly Dependency Ratios in China, 1990-2050



Source: Chiu 46

This policy recommendation has received increasing support from many prominent Chinese demographers. Wang Feng, the director of the Brookings-Tsinghua Center for Public Policy in Beijing said in July, "The phasing out of the policy should have begun at least 10 years ago" (Langfitt 1). Similarly, Gu Baochang, a leading demographer at Renmin University of China, petitioned top Chinese leaders to end the policy, saying, "It is time to think about removing this policy decided 30 years ago—China's situation has changed so much" (Ibid.). Given the projected growth of the elderly population, China currently has a small window of opportunity to add an influx of young workers. In order to remain competitive in the global economy, China should begin to loosen the policy to avoid dire economic consequences.

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The Game Theory Behind Acing an Exam

By Anne Evered '15

Last December, students at Johns Hopkins University took advantage of their computer science professor's grading policies to essentially "game" the system and receive full marks on an exam without ever filling out a single answer.

Professor Fröhlich, who teaches courses in computer science, grades the exams for his classes on a curved scale with the highest grade of the class counted as a 100% and the rest of the scores scaled accordingly. This system leaves open a loophole: if all students get 0's, then a 0 is the highest score, so all students would receive a 100%. This year, students in three of Fröhlich's classes took advantage of this loophole and set up a boycott of the test, the catch being that the plan would only work if everyone stuck to it.

What happened on the day of the test is an all but miraculous show of collaboration. As Professor Fröhlich recounts, "The students refused to come into the room and take the exam, so we sat there for a while: me on the inside, they on