

Demographic Challenges for a Rising China

Deborah S. Davis

Abstract: Looking into the near future, China faces immense demographic challenges. Prolonged sub-replacement fertility has created irreversible conditions for rapid aging of the population, and massive migration to cities has left many villages populated by elderly farmers with no adult children to support them. Soaring divorce rates and high levels of residential dislocation have eroded family stability. To a large extent, government policies created to accelerate economic growth inadvertently fostered these demographic challenges, and now the country is facing the negative consequences of interventions that previously spurred double-digit growth. Legacies of Confucian familism initially blunted pressures on families. Filial sons and daughters sent back remittances, parents cared for migrants' children and invested in their children's marriages, and families with four grandparents, two parents, and one child (4+2+1) pooled resources to continuously improve a family's material well-being. But now the demographic challenges have further intensified and the question arises: can the state adopt new policies that will allow the prototypical 4+2+1 families created by the one-child policy to thrive through 2030?

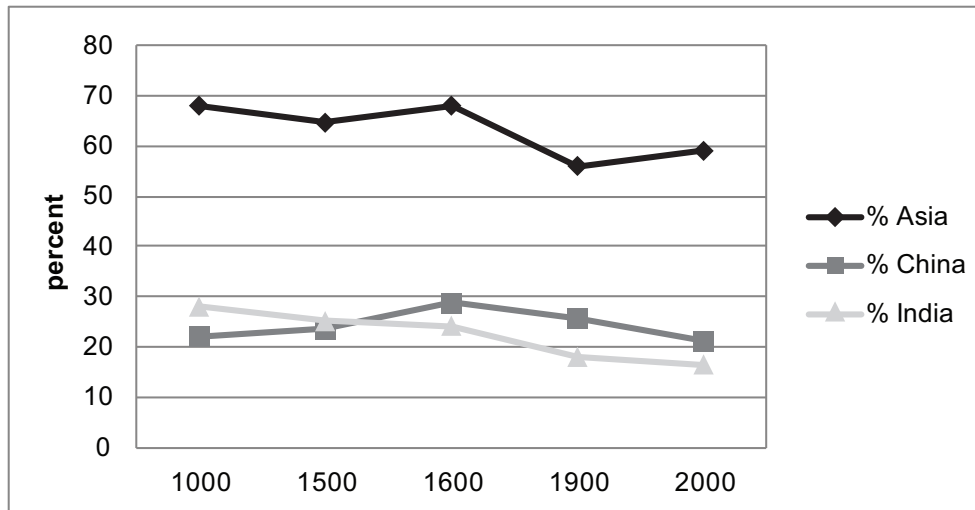
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For more than a millennium, Asia has been the demographic center of the world, and since 1500 China has been the global demographic giant (see Figure 1).¹ Sometime in the next fifteen years India will again overtake China as the largest nation, but demographic challenges within China will shape both China's future and that of the world.² In part, China's continuing global influence flows from its sheer size, but as I will discuss, underlying demographic dynamics in fertility, urbanization, and family formation have created demographic challenges for which there are no easy answers. Prolonged sub-replacement fertility in particular has created irreversible conditions for rapid aging of the population, and massive migration to cities has left many villages populated by frail elders without adult children to support them. Promulgation of no-fault divorce legislation and a liberalized sexual climate, in the context of this rapid aging of the

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doi:10.1162/DAED_a_00270

Figure 1
World Population, 1000 – 2000

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Source: Based on data from Home Maddison, <http://www.ggdc.net/maddison/Maddison.htm>.

population and high levels of residential dislocation, have further eroded the stability of family life. Government policies created to jump-start the economy initially allowed China to reap a demographic dividend. As birth rates plummeted, the ratio of workers to non-workers rose, and savings from child-rearing at both household and community levels spurred investment in education, health, and infrastructure. But after twenty years, the dividend has run out, and China is facing the negative consequences of policies that previously spurred thirty years of double-digit growth. Legacies of Confucian familism initially blunted the pressure on families. Filial sons and daughters sent back remittances, parents cared for migrants' children and invested in their children's marriages, and urban families with four grandparents, two parents, and one child (4+2+1) pooled

resources to continuously improve material well-being; but now the demographic challenges have intensified and the question thus arises: can the state adopt new policies that will allow the emerging prototypical 4+2+1 families created by the one-child policy to thrive through 2030?

When China is compared to other nations, attention immediately focuses on its unique one-child policy. Nowhere else in the world has a central government so systematically imposed such a draconian limit on women's childbearing. One outcome is sub-replacement fertility; a second is a rapid and accelerating aging of the population. In 1980, less than 6 percent of the Chinese population was 65 or older. Like India and Vietnam, China was a country dominated by the young. However, should birth rates continue at their

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current sub-replacement level over the next twenty years (as they are predicted to do), by 2030 China will have a slightly higher percentage of elderly than the United States or Russia. By contrast, India's elderly population will have risen to only 8 percent and Vietnam's to 12 percent (see Figure 2).

China's rapid drop in birth rates did not originate with the one-child policy launched in 1980. Rather, birth rates first plunged in the prior decade as a result of a nationwide drive to delay marriage and space births.³ The rapid decline in birth rates between 1970 and 1979, however, does not mean that the one-child policy has had no significant impact. On the contrary, by enforcing a one-child limit throughout urban China as well as in prosperous peri-urban villages, the policy enforced sub-replacement fertility rates previously found only in wealthy countries with a high percentage of college-educated women. Moreover, if such low birth rates persist in China at the same time as more women enter college, life expectancy increases, and out-migration continues to exceed in-migration, then China's population will age as quickly as did that of Germany, Italy, and Japan. However, in contrast to these countries, China will become old before it becomes rich. In addition, because China lacks the national pension and medical insurance programs provided in these wealthy nations, the next generation of Chinese elderly will face extensive hardships for which there are no easy solutions.

The second demographic trend that poses future challenges is the abrupt switch from a village society of low mobility to an urban society in which many millions change residence every year. In 1980, less than 20 percent of the population lived in cities or towns. By 2010, more than 50 percent had settled in urban

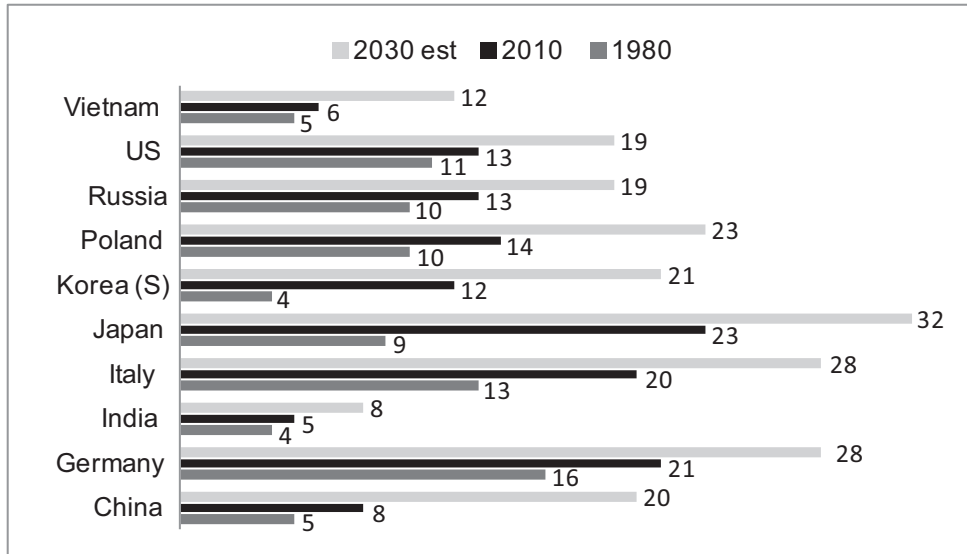
areas. Moreover, the shift is not only due to the fact that more people, particularly those between the ages of 18 and 49, now live and work in cities, but that the number of very large cities has also greatly increased. In 1981, there were only eighteen cities with a population of more than one million; by 2009, there were 129.⁴ Finally, because it is primarily the young who leave the countryside in search of work in the cities while those over 50 remain in the villages, rural China is both "hollowing out" and quickly "growing grey."

Government ambition to jump-start economic growth partially drove the rapid urbanization. Breaking with the Maoist mantra of collective ownership and village self-reliance, the Deng leadership dissolved the People's Communes, encouraged rural entrepreneurship, and, for the first time in thirty years, allowed rural residents to freely find work in cities and towns. Massive migration into industrial and service jobs is not unique to China; in fact, both Japan and Korea experienced comparable mobility during their rapid transitions into industrial giants. However, China's larger population and its immediate socialist past have made China's experience somewhat distinctive. First, the number of villagers who have moved to towns and cities is approximately twice the size of the entire Japanese population and five times that of South Korea. One does not want to overemphasize China's exceptional size, but when considering future policy responses and cross-national comparisons, the human scale of China's urbanization cannot be ignored.

A second distinctive element of China's urbanization is the continued reliance on a nationwide household registration system that distinguishes between temporary and permanent urban residents. Designed in 1958 to ration foodstuffs and control population movement, the household registration system maintained through

Figure 2
Percent of World Population (in select countries) Age 65 or Older

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For proportion of elderly and projections for 1980 and 2010 in all ten countries: World Bank, <http://data.worldbank.org/indicator/SP.POP.65UP.TO.ZS/countries> (accessed April 8, 2013); for the projections for European countries: Marija Mamolo and Sergei Scherbov, "Population Projections for 44 European Countries," http://www.oew.ac.at/vid/download/edrp_2_09.pdf (accessed April 9, 2013); for the U.S. projections: Population Division, U.S. Census Bureau, "Population by Age and Sex for the United States: 2010 to 2050" (NP2008-T12), Table 12 (released August 14, 2008), http://www.aoa.gov/Aging_Statistics/future_growth/future_growth.aspx (accessed April 9, 2013); for Japan: Ministry of Internal Affairs, Population Statistics Bureau, <http://www.stat.go.jp/english/data/handbook/co2cont.htm> (accessed April 9, 2013); for China: Feng Wang, "Racing towards the Precipice," *China Economic Quarterly* (June 2012) and Feng Wang, "The Future of a Demographic Overachiever," *Population and Development Review* 37 (s1) (2011): 173–190; for Vietnam: International Futures, http://www.ifs.du.edu/ifs/frm_CountryProfile.aspx?Country=VN.

the public security bureau served to freeze most rural men in their birth villages and allowed women to move only when they married. Since the early 1980s, the Mao-era restrictions on geographic movement have eroded, but by labeling new arrivals as "temporary" urban residents, the household registration system denies them access to subsidized housing, education, or medical care in the cities where they live. As a result, the household registration system enforces social and economic divisions between migrants

and other city residents—divisions resembling those between undocumented immigrants and native-born residents in the United States. At one time, the government announced it would end this discriminatory system by the start of the Beijing Olympics. But as of December 2013, little has changed, and even those who have lived and worked in the cities for more than a decade do not have the same civil and social rights as permanent urban residents.⁵

In many ways, China's demographic shifts since 1980 resemble those of other fast-growing, industrializing economies. Birth rates fall as more women complete secondary school, contraception becomes cheap and effective, and employers prefer women over men for many new non-agricultural jobs. As industrial jobs pull youth away from the countryside and as infrastructure improves, the urban populations grow and village populations age. As women become more economically self-sufficient and legal reforms tilt to protect individual civil rights, divorce rates rise. Yet China's demographic trajectory and patterns of household formation do not exactly duplicate patterns observed elsewhere. First, when China plateaued at sub-replacement fertility, the sex ratio at birth (SRB) became so distorted in favor of boys that today many millions of girls are "missing." In Europe and the Americas, SRB remained unchanged even as fertility declined. Second, while China's crude divorce rate (CDR)—that is, the number of divorces per 1,000 in the population in any one year—has doubled over the past decade, marriage remains nearly universal, and rates of remarriage are increasing. By contrast, in Europe, the Americas, and even Hong Kong and Taiwan, marriage rates are falling. Third, childbearing outside of marriage in China is not only rare, but illegal.⁶ Specific state interventions have been decisive, but so, too, has been the continuing influence of the norms of Confucian familism, which have both exacerbated demographic distortions and ameliorated the initial consequences of rapid urbanization, insecure marriages, and falling fertility.

I turn first to the demographic masculinization created by distorted SRB and the subsequent problem of "missing girls." Concern with distorted sex ratios surfaced immediately after the launch of the one-

child policy. But in fact, girls have been "missing" and the population therefore masculinized throughout China's history. Demographer Cai Yong estimates that in the past hundred years, the sex imbalance at birth peaked between 1936 and 1940.⁷ Nevertheless, the imbalance since 1980 reverses a decline that began after 1949. Equally disturbing, the imbalance has widened as a greater percentage of women conform to the one-child quota. Thus, for example, in 1980 the SRB of 108 boys to 100 girls barely exceeded the normal range of 103–106 boys to every 100 girls; but since 1990, the ratio has hovered around 120 boys per 100 girls and in 2008 reached a high of 123.2 before falling to 120 in 2010.⁸ Complete compliance with the one-child policy would mean that half of all families would have no son, an outcome that is unacceptable in a society where tradition requires all men to have a son to continue his family line. More practically, given the absence of a national system of social security or pensions for elderly in the countryside or those working in the urban private sector, the one-child limit promises high levels of financial insecurity in old age. And for those whose first born is a daughter, who by "tradition" will marry out to another family, a one-child policy immediately raises the specter of severe impoverishment. Thus, it is hardly surprising that many Chinese couples have resorted to sex-selective abortion to guarantee that they will have at least one son.

Again, it is important to compare China to its Asian neighbors. According to a 2012 United Nations Population Fund (UNFPA) report, SRBs have recently tilted strongly to boys in several parts of Asia, beginning in China, India, and South Korea in the 1980s and since then spreading to Azerbaijan, Armenia, Georgia, Montenegro, Albania, and Vietnam. Population experts estimate the global impact is 117 million "missing girls" as of 2010, most of them

in China and India.⁹ On the other hand, as seen recently in South Korea, Singapore, and Taiwan, as well as in China during the first decades after 1949, policy interventions can reverse population masculinization. The question is whether China, particularly within the context of the one-child policy, can succeed. Since the early 1980s, the Chinese government has adopted several policies to reverse the masculinization of the population. In 1986 they banned sex-selective abortion, in 1993 they “forbade” it, and in 2002 the prohibition was included in the 2002 Population and Family Planning Law. In addition to broad policy initiatives, the government directly intervened in counties where the SRB was exceptionally high to enforce the ban on the use of ultrasound for sex-selective abortion and to provide benefits to families with a single daughter. They also did extensive propaganda work to support gender equality and punished officials in villages where SRB did not decline. After the SRB in twenty-four experimental counties targeted in the “Care for Girls” program fell from 133.8 to 119.6, the program went national.¹⁰ Nevertheless, the nationwide SRB peaked in 2008, and between 2000 and 2010 the ratio rose even among college-educated women. Thus, the key challenge is not the one-child limit *per se*, but rather the larger economic, social, and political conditions that make a one-daughter family unacceptable. For some families, the key issue is the necessity to continue the patriline and traditions of ancestor veneration. For others, it is primarily fear of economic insecurity. The poorest families feel this pressure most acutely, but even for those with steady current income, there is no assurance that they can accumulate adequate savings to provide basic economic survival in old age. For these reasons, the demographic challenges facing the Chinese government differ significantly both from those of rich

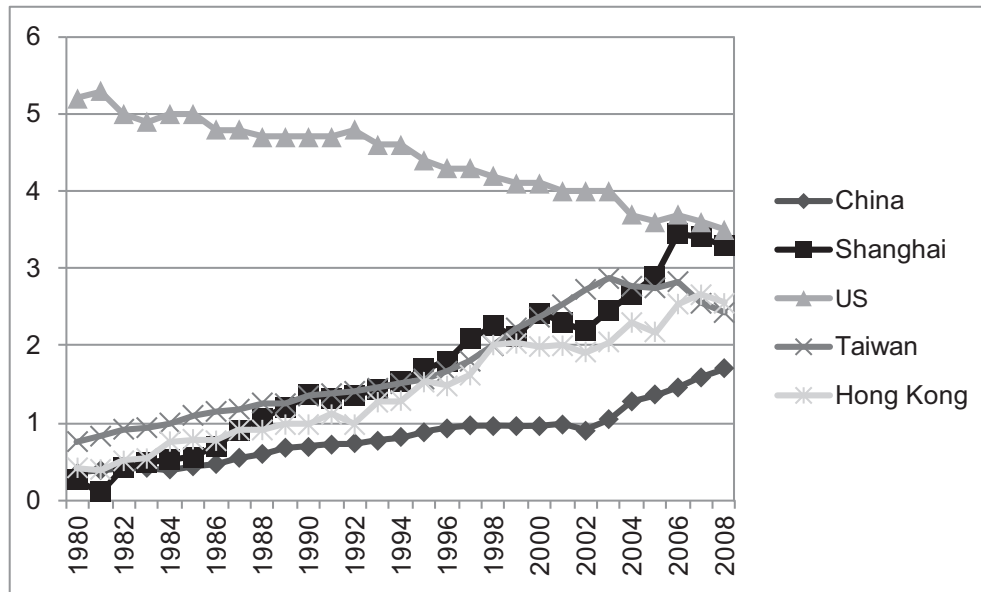
societies with similar fertility but less distorted sex ratios and from poorer countries with higher fertility but comparable masculinization of the population.

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A second way in which China looks demographically distinct not only from Europe and the Americas but also from several Asian neighbors is the recent shift in rates of divorce and marriage. During the Mao era, highly restrictive legal and regulatory procedures made divorce rare except in cases of extreme abuse or political stigma. However, as part of Deng’s commitment to reduce state supervision and politicization of everyday life, the National People’s Congress promulgated a new Marriage Law in 1980, permitting couples to dissolve their marriages outside the courts whenever both parties agreed that mutual affection had completely disappeared. In 2001 the Marriage Law was further liberalized, and in 2003 the Ministry of Civil Affairs removed the requirement that couples seeking either to marry or to divorce must secure written approval from their village head or employer. Not surprisingly, divorce rates spiked upward after 2003. In 1980 there were fewer than 350,000 divorces, by 1990 there were more than 800,000, in 1995 more than a million, and in 2011 2.8 million.¹¹ In cities like Shanghai the rates were higher than in Taiwan or Hong Kong, and had begun to approach divorce rates in the United States (see Figure 3).

However, even though the CDR rose 600 percent between 1980 and 2011, and by more than a factor of ten in the city of Shanghai,¹² marriage remains popular. For example, the crude marriage rate (CMR: the number of marriages per 1,000 in the population in any one year) has risen over the past decade in China while falling or holding steady elsewhere in East Asia, Europe, and North America (see Figure 4). In addition, the absolute number of indi-

Figure 3
Crude Divorce Rates, 1980–2008



Sources: For China, 1980–2008: *Zhongguo Tongji Nian Jian 2012*, <http://www.infobank.cn> (accessed February 16, 2013); for Shanghai: *Shanghai Tongji Nian Jian 2011*; for Taiwan: Department of Statistics, Ministry of Interior, <http://sowf.moi.gov.tw/stat/month/m1-02.xls>; for United States: <http://www.census.gov/prod/2011pubs/12statab/vitstat.pdf>; for Hong Kong: Census and Statistics Department HK (1973–2009).

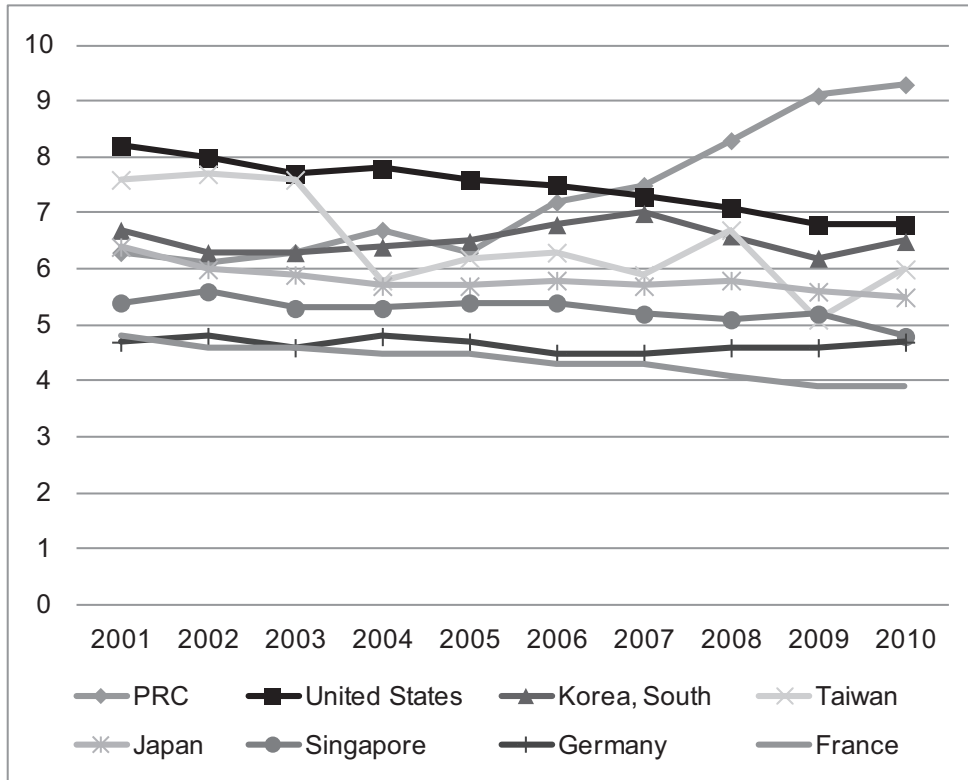
viduals marrying has recently spiked upward. In 2011, twenty-six million people married, a total that was eleven million greater than in 2000, 2001, or 2002, and a difference that cannot easily be attributed to a radical increase in the number of men and women of marriageable age in less than a decade.¹³ Rather, it is more likely that the CMR rose after 2003 as a result of three factors: slightly larger cohort size, catch-up among those who had postponed marriage, and rising rates of remarriage after divorce.¹⁴

Given that divorce rates have risen over the same period, it is not unexpected that remarriage rates would increase in tandem. But on the other hand, it is theoret-

ically possible that in years when many marriages fail, those who divorce will prefer not to risk another failure. In China, though, the story is on the side of willingness to try again. Nationwide between 1985 and 2010, the percentage of those marrying in any one year who had previously been married rose from 3 percent to 11 percent.¹⁵ Moreover, when one compares the absolute number of remarried persons by gender, age, and rural/urban residence, we find that the data contradict a common perception that women are unlikely to remarry after divorce. Surveys from 2009 instead indicate that in villages, among those under age 60, women are far more likely to have remarried than men, and in

Figure 4
Crude Marriage Rate, 2001 – 2010

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Source: Taiwan Ministry of Information, <http://sowf.moi.gov.tw/stat/english/enational/j23.xls>.

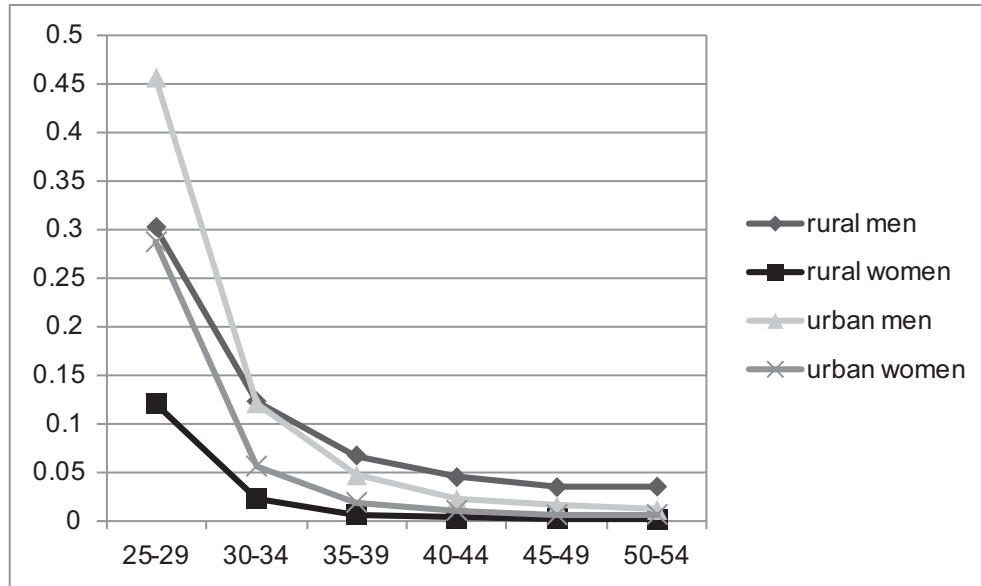
cities remarried men outnumber remarried women only among those over age 50.¹⁶ In sum, while marriages in China have indeed become increasingly fragile, the institution of marriage remains normatively robust.

Another demographic indicator that speaks to the continued desirability of marriage is the low percent of never-married persons across different age cohorts. Thus when we compare 2009 rates of never-marrying, for example, we observe a pattern of nearly universal marriage except

among those born after 1980 (see Figure 5). It is of course too soon to know what percentage from this youngest cohort will eventually marry, but the upturn in CMR, the recent surge in the absolute number of marriages, and the rising rate of remarriage document strong commitment to the institution of marriage and suggest that a large majority of those born after 1980 will marry at least once. The one demographic group in which rates of marriage may fall will be among rural men born after 1980, with the proximate cause

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Figure 5
Percentage Never Married (in 2009), by Age, Gender, and Residence



Source: *Zhongguo renkou he jiuye tongji nianjian 2010* (Chinese Population and Employment Statistical Yearbook 2010), <http://www.infobank.cn/IrisBin/Text.dll?db=TJ&no=479213&cs=13957592&str=%BB%E9> (accessed May 14, 2011).

of decline owing to the gender imbalance created by the one-child policy, not a reduced desire to marry.

Finally, I turn to the persistent and strong linkage between marriage and childbearing. As in other Asian societies, childbearing in China occurs almost exclusively within and after marriage.¹⁷ Thus, in stark contrast to recent trends in Europe and the Americas, there are very few extramarital births in China, and we observe no significant increase in such births even as young women achieve educational parity with men and society becomes noticeably more accepting of nonmarital sexual relationships.¹⁸ While it is true that People's Republic of China law prohibits

births outside of marriage, by far the more important barrier to births outside marriage is adherence to the norms of patrilineal familism.

As in other Asian societies, marriages are conflated with parenthood and family continuation. Therefore, while second marriages or those among the elderly may be legitimately configured around caretaking or shared livelihood, for young adults in a first marriage, marriage is the necessary first step in a sequence that will lead to pregnancy and the birth of a child to a married couple. Historically, because wealthy men were permitted, even encouraged, to have multiple consorts, siblings in wealthy households often had different mothers. At the same time, high

mortality of women in childbirth and the ravages of war and famine meant that children of the poor also often had half- and step-siblings. However, overall, few children were born to an unmarried woman, and never-married women could not openly raise a biological child as their own. During the high socialist years, this conflation and sequencing of marriage and parenting became even tighter. The Marriage Law of 1950 prohibited concubinage, and the Chinese Communist Party proclaimed the nuclear family of parents and their children as the cell of society, while the politicization of private life threatened punishment to those who violated the orthodox sequence of marriage followed by parenthood.

To date, the conflation and sequencing of marriage and parenthood continue. Moreover, the one-child policy has heightened the value of parenthood for men as well as women, as the single child becomes a parent's "only hope" for a secure old age. In contrast to the sub-replacement fertility and the skewed sex ratios, however, this by-product of the one-child policy has not as negatively affected family life. On the contrary, it has increased social and financial supports for children throughout the country, including new forms of activism among men and women mobilizing as parents in support of better treatment or protection of their children. The cases of parents filing suits in order to receive compensation for tainted milk powder is one well-known example; more recent and less well known is the successful mobilization of migrant parents to allow their children to take the university entrance exams in the cities where they live rather than having to return to the parents' rural county. The group, Citizens United Action for Equal Rights of Education, formed in Beijing in 2010. Later the group expanded beyond Beijing and drafted proposals calling for reform. Several lawyers

joined the group, and in August 2012 the Ministry of Education mandated that every province release plans to expand the opportunities for children of rural migrants to sit for high school and university exams.¹⁹

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Demography is not destiny. Yet unless a society permits substantial, permanent migration of adults, the number of births in any one year forever determines the maximum size of each birth cohort. Similarly, unless there is prolonged war with high male fatalities and/or high maternal mortality, the ratio of males to females established at birth will forever shape the life chances of that generation and leave an indelible imprint on a nation's demographic profile. Consequently, given three decades of low birth rates, high levels of sex-selective abortion, rising life expectancy and falling maternal mortality, no wars, and no international in-migration, it is not difficult to identify the key demographic challenges and their impact on family life over the next ten or twenty years. The Chinese population will age very rapidly, an increasing percentage of young men will never marry, and a majority of people entering retirement after 2020 will face an economically insecure old age with only one adult child as a source of support.

None of these trends will surprise the Chinese leadership. In fact, the government has already responded to them. Recently, the central government mandated an improved rural medical insurance system and reduced fees for village schools in the hope that the quality and security of rural life will improve. In 2011 they instituted a pilot pension program for urban residents. As noted, they have launched a nationwide campaign to "care for girls," and at the Third Plenum in November 2013, the leadership announced that henceforth couples in which only

one spouse had no siblings could have a second child. Yet, at best, these shifts ameliorate negative outcomes. If life expectancies for those who reach age 50 continue to improve as expected, the elderly population will grow faster than it has in the past two decades, and without massive international migration of single women under the age of 30, millions of men now in their twenties will never find a bride. Changes in pension and medical safety nets can increase quality of life, but they cannot create a new demographic profile among those born before 2012.

During the previous three decades, when birth rates fell below replacement, China reaped a demographic dividend from the rising ratio of working-age to non-working-age people in the overall population. As public health policy scholars David Bloom and David Canning explain in their comparison of China's and India's demographic challenges, if a society uses the demographic dividend to increase investment in education, health, and infrastructure, they can translate the demographic shift into rapid economic growth and higher standards of living.²⁰ Between 1980 and 2000, China benefited from such a virtuous exchange. With India now entering this demographic position, the question is whether it can repeat China's experience. The jury is still out.

For China, however, the question now is how to respond after the demographic dividend has been spent. Population aging need not halt macroeconomic growth if managed well by such public policies that would allow those over 60 to remain economically active, encourage transnational migration of working-age adults, improve medical safety nets, or devise new forms of mandated saving. However, as Bloom and Canning explain, such initiatives assume a level of wealth and institutions of financial accountability that we do not yet find in contemporary China. More-

over, although the November 2013 Plenum gave a small subset of young couples the option to have a second child, the one-child policy remains in place, and the current leadership appears unwilling to reject a policy with known negative consequences for the nation and individual families. At the same time, they continue to champion relocation of millions of villagers to cities and towns without eliminating the discriminatory policies that deny rural migrants equitable access to urban social welfare and housing.²¹ In a recent essay, Asia health policy expert Karen Eggleston and her colleagues ask, "Will Demographic Change Slow China's Rise?"²² Relying on a "standard growth accounting model," they conclude that demographic trends will slow macrolevel growth over the next five years, but that the most destabilizing impact of population aging and distorted sex ratios will arise only after economic growth stalls. In contrast, by expanding the analytic lens beyond economic accounting models to factor in dynamics of family life, one can already observe deleterious impacts on Chinese society and local communities.

The national leadership is aware of these negative consequences, but focused on GDP growth rates and immediate threats to the political status quo, they have yet to acknowledge either the root causes or long-term consequences of their migration and population policies that created current demographic challenges. Over the next decade, the number of 4+2+1 families will increase, and the ability of the leadership to respond to their insecurities will decisively affect the quality of life as well as rates of economic growth.

ENDNOTES

- 1 These estimates by historical demographer Angus Maddison; “Asia” includes not only all countries in Northeast, Southeast, and South Asia but also what is now considered the Middle East.
- 2 United Nations Department of Economic and Social Affairs, Population Division, 2013, <http://esa.un.org/wpp/unpp/p2kodata.asp>.
- 3 Feng Wang, “The Future of a Demographic Overachiever,” *Population and Development Review* 37 (s1) (2011): 173–190.
- 4 Xuefei Ren, *Urban China* (Cambridge: Polity Press, 2013), 11.
- 5 Kam Wing Chan, “China Internal Migration,” in *The Encyclopedia of Global Migration*, ed. Immanuel Ness and Peter Bellwood (Oxford: Blackwell, 2012), 1–17.
- 6 Immigration and Refugee Board of Canada, “China: Treatment of pregnant, unmarried women by state authorities, particularly in Guangdong and Fujian; whether unmarried women are obliged to undergo pregnancy tests by family planning officials (2005–April 2009),” CHN103135.E, June 23, 2009, <http://www.unhcr.org/refworld/docid/4a7040b626.html> (accessed March 29, 2013); and Carl Haub, “Births Outside of Marriage Now Common in Many Countries of Europe,” Population Reference Bureau, November 2010, <http://www.prb.org/Articles/2010/birthsoutsidemarriage.aspx>.
- 7 Yong Cai, “China’s Demographic Challenges: Gender Imbalance,” paper presented at China’s Challenges, a conference at the University of Pennsylvania, April 25, 2013.
- 8 These are adjusted SRB figures from *ibid.* In official unadjusted figures from the Chinese government, the high was 121 in 2004. See http://news.xinhuanet.com/english/china/2013-03/05/c_132209268.htm (accessed April 18, 2013).
- 9 United Nations Population Fund, Asia Pacific Region Office, *Sex Imbalances at Birth: Current Trends, Consequences and Policy Implications*, August 2012, <http://www.unfpa.org/public/home/publications/pid/12405>.
- 10 Zijuan Shang, Shuzhao Li, and Marcus Feldman, “Policy Responses of Gender Imbalance in China,” Working Paper No. 123 (Morrison Institute for Population and Resource Studies, Stanford University, 2012), <http://hsblogs.stanford.edu/morrison/files/2012/11/125-noilb4.pdf>.
- 11 See *Zhongguo Tongji Nianjian 2012* [*Chinese Statistical Yearbook 2012*], online version, <http://www.infobank.cn>.
- 12 In 1980, the CDR in China was 0.35; in 2011, it was 2.07. For Shanghai, the shift in the same period was from 0.27 to 3.39.
- 13 In 2000, 16.9 million people married; in 2001, 15.9; in 2002, 15.5; and in 2011, more than 26 million. See *Zhongguo Tongji Nianjian 2012*. According to the 2010 census, the size of cohorts born between 1972 and 1991 is extremely uneven: the youngest cohort (born in 1986–1990) is much larger than those born in 1981–1985 and 1976–1980, but about the same size as those born in 1971–1975. See Carl Haub, “China Releases First 2010 Census,” Population Reference Bureau, 2011, <http://www.prb.org/articels/2011/china-census-results.aspx> (accessed February 26, 2013).
- 14 Yong Cai, personal communication with author, February 27, 2013.
- 15 *Chinese Statistical Yearbook 2012*.
- 16 *Zhongguo renkou he jiuYe tongjinianjian 2010* [*Chinese Population and Employment Yearbook*], <http://www.infobank.cn/IrisBin/Text.dll?db=TJ&no=479749&cs=3604210&str=%D4%D9%BB%E9>. In Shanghai, 19.5 percent of all those marrying in 2011 had been previously married, half of whom were women; see *Chinese Statistical Yearbook 2012*.
- 17 Gavin Jones and Bina Gubhaju, “Factors Influencing Changes in Mean Age at First Marriage and Proportions Never Marrying in the Low-Fertility Countries of East and South East Asia,” *Asian Population Studies* 5 (3): 237–265.

- ¹⁸ Exact rates of extramarital births are difficult to compute and compare, but rough estimates for 2007–2009 were 5.6 percent for China, 1.4 percent for Japan, and 3.1 percent for Israel. By contrast, in France the rate of extramarital births increased from 11 percent in 1980 to 50 percent in 2007, from 12 percent to 44 percent in the United Kingdom, from 18 percent to 40 percent in the United States, and from 4 percent to 28 percent in Spain. See <http://www.cdc.gov/nchs/data/databriefs/db18.htm#UScompared> and [http://en.wikipedia.org/wiki/Legitimacy_%28law%](http://en.wikipedia.org/wiki/Legitimacy_%28law%29).
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- ²⁰ David E. Bloom and David Canning, “Demographics and Development Policy,” Working Paper No. 66 (Program on the Global Demography of Aging, Harvard School of Public Health, 2011), <http://www.hsph.harvard.edu/pgda/working.htm>.
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