

China's Revolution in Family Structure

*A Huge Demographic Blind Spot
with Surprises Ahead*



Nicholas Eberstadt and Ashton Verdery

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American Enterprise Institute
1789 Massachusetts Avenue, NW
Washington, DC 20036
www.aei.org

Executive Summary

Researchers and decision makers in Beijing and the West pay close attention to many major Chinese population trends, including its pronounced sub-replacement fertility, its shrinking manpower totals, and its rapid population aging. Yet one momentous demographic trend in China has as yet attracted almost no interest: the transformation of the country's family structure.

The reason for this oversight is obvious. Beijing, like other modern governments, simply does not collect information on family structure or kinship networks—so the regime does not think about the issue and its implications.

In this report, we model *simulations* of China's past and prospective patterns and trends in kinship networks. We then use the results from these simulations to analyze, assess, and speculate about their implications for China's social, economic, and political future. We believe this is the first study to think through the far-reaching implications of the results of demographic and kinship network modeling for a national population of a major economy and great power.

Our simulations show that the Chinese family is about to undergo a radical and historically unprecedented transition, as extended kinship networks atrophy across the nation and close blood relatives disappear altogether for many. This fraying of the extended family and atomization of the nuclear family come at an almost exquisitely inopportune moment in China: Social needs are soaring alongside the rising tally of elderly dependents and the shrinking ranks of those on whom the elderly can rely—two social indicators poised for inescapable collision in the years immediately ahead. Indeed, the withering of the Chinese family as we now know it will make for new and unfamiliar challenges at every stage in the life cycle, for both Chinese people and the Chinese state.

2 CHINA'S REVOLUTION IN FAMILY STRUCTURE

Our simulations revealed several key findings.

- An unexpected finding: In terms of sheer quantity, Chinese networks of blood kin were never before nearly as thick as at the start of the 21st century. Due to dramatic improvements in survival, men and women in their 30s today (2020) have on average five times as many living cousins as in 1960. China's "kin explosion" may be an important, heretofore unobserved, factor helping explain the Chinese economy's remarkable performance since Mao Zedong's death.
- But that kin explosion has reached its zenith, and China is now on the cusp of a severe, unavoidable, and unrelenting "kin crash," driven by its prolonged and increasingly steep sub-replacement fertility patterns. The implosion of consanguineous family networks, in our models, means that China's rising generations will likely have fewer living relatives than ever before in Chinese history: A "kin famine" looms.
- Population simulations also project a radical inversion within the nuclear family, with living parents and in-laws outnumbering children for middle-aged Chinese men and women. Further, due to the surfeit of baby boys under the notorious One-Child Policy (1980–2015) and declining cohort sizes, growing numbers of men in the decades ahead will enter old age without spouses or children—the traditional sources of support for the elderly.
- China's coming revolution in family structure stands to overturn fundamental social arrangements taken for granted today. The focus of the family in China will necessarily be redirected from the rearing of the young to the care of the old. The reliability and durability of familial bonds of duty will be an increasingly crucial question—perhaps even a matter of life and death for many, including frail and impecunious elders in the Chinese hinterlands.
- Notwithstanding the looming macroeconomic implications of old-age dependency burdens, the most consequential economic impact of China's coming revolution in family may actually concern the

micro-foundations of the national economy. Since earliest recorded history, China's *guanxi* networks have helped get business done by reducing uncertainty and transaction costs. Just as proliferation of blood relatives likely proved a powerful stimulant for growth during the era of China's phenomenal upswing, the drastic coming plunge in living biological kin in China between now and 2050 may prove an economic depressant.

- The coming revolution in Chinese family structure promises to have political reverberations as well. If the waning of the family requires China to build a huge social welfare state over the coming generation, as we surmise it will, then Beijing would have that much less where-withal at its disposal for influencing events abroad through economic diplomacy and defense policy.
- Further, our simulations indicate that by 2050, close to half of China's overall pool of male military-age manpower will be made up of only children. Any encounter by China's security forces involving significant loss of life will almost unavoidably presage lineage extinction for many Chinese families. Autocracies are typically tolerant of casualties—but this may not at all be the case in the only-child China of today and the coming decades.

Analysts and decision makers in China (and elsewhere) have barely begun to think about the many ramifications of this great disruption for China's future. Inattention to Chinese family structure is a blind spot—quite possibly a fateful one.

China's Revolution in Family Structure: A Huge Demographic Blind Spot with Surprises Ahead

Nicholas Eberstadt and Ashton Verderer

Dramatic demographic changes are underway in China, and they bear directly on the country's economic, social, and geopolitical outlook for the decades ahead.¹ Beijing's official announcement in January 2023 that deaths slightly exceeded births in the People's Republic of China (PRC) in 2022² and that total population for the country fell for the first time since the Great Famine of 1959–61 that followed Mao Zedong's Great Leap Forward are only the latest reminders that population trends are constantly recasting the trajectory of "China's rise."

Researchers and decision makers in Beijing and the West pay close attention to many major Chinese population trends and their implications—among these, pronounced and continuing sub-replacement fertility, shrinking working-age manpower, rapid population aging, and emerging surfeits of marriageable men, partly due to sex-selective abortions. Yet those convey only some of the demographic headwinds facing the world's largest economy and most populous society. One momentous demographic trend in China has as yet attracted almost no interest: the transformation of the country's family structure.

Inattention to Chinese family structure is a blind spot—quite possibly a fateful one. The Chinese family is already set to undergo a radical and historically unprecedented transition, as extended kinship networks atrophy across the nation and close blood relatives disappear altogether for many. This fraying of the extended family and atomization of the nuclear family come at an almost exquisitely inopportune moment in China: Social needs are soaring with the rising tally of elderly dependents and shrinking ranks of those on whom elderly can rely—two social indicators

poised for collision and rapidly. Indeed, the withering of the Chinese family as we now know it will make for new and unfamiliar challenges at every stage in the life cycle, for people and for the Chinese state. We have barely begun to think about the many ramifications of this great disruption for China's future.

The impending upheaval in Chinese family structure is by now essentially unstoppable; a new family order is all but inescapable for China's rising young generations. Because their parents had fewer children and they had fewer siblings, their children will necessarily have few aunts, uncles, and cousins. This upheaval promises to be massive in magnitude, replete with far-reaching reverberations—and is coming surprisingly soon.

Why has such an enormous, and potentially revolutionary, demographic change gone overlooked by China's formidable cadre of academics, researchers, and advisers—and their overseas counterparts? The answer unfortunately is obvious. Beijing simply does not collect information on family structure or kinship networks—so the regime does not think about the issue and its implications. They plan for fewer people, not fewer nieces.

Such oversight is hardly new, nor is it peculiar to China. Standing governments have never regarded data on family as relevant to statecraft or security. Empires and states have been conducting censuses for thousands of years—the earliest of them in the Mediterranean and China. But in antiquity, these population counts were designed for taxation and military mobilization—thus, the focus on households and head counts.

That ancient design still informs modern statistical authorities everywhere. Although their techniques for surveying populations may be vastly more sophisticated nowadays, and although the sheer volume of demographic data at their disposal may likewise be exponentially greater, modern governments the world over still fail to ask for information about kinship from their citizens and subjects—and thus do not obtain it. Outside those working with the closely guarded population register data in some Scandinavian countries, who must apply clever approaches to enumerate kin, the kinship systems linking whole societies remain unseen.

In this report, we attempt to illuminate this major demographic blind spot in China's population profile through modeling simulations of China's past and prospective patterns and trends in kinship networks. We then use the results from these simulations to analyze, assess, and

speculate about their implications for the Chinese future, in the social, economic, and even political realms. We believe this is the first study to think through the far-reaching implications of the results of demographic and kinship network modeling for a national population of a major economy and great power. We hope to demonstrate the utility of such explorations and encourage similar studies for the populations of other contemporary societies.

As we will show, the story of China's revolution in family structure is more complicated than typically thought. Scholars, pundits, and members of the public certainly appreciate that the country's family experience is changing. China's notorious fertility-control policies in effect from the 1970s to 2015 are well-known, for instance, and it is not a leap to reason that such policies—and the other demographic reversals discussed above—presage considerable change in family structure. But how such policies and trends fit in the context of China's shifting family landscape, how much has changed in the past 80 years, and just how much is likely to change again in the next 80 is a largely untold story.

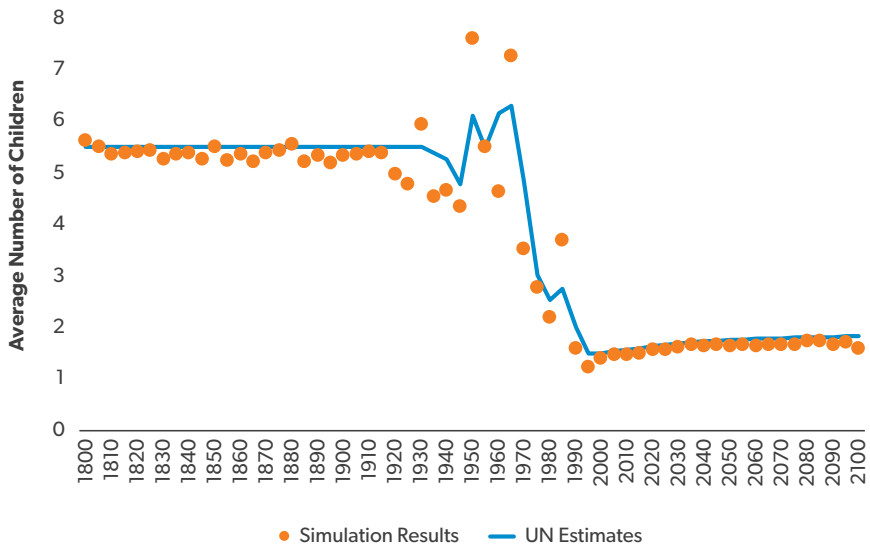
Modeling China's Changing Family Patterns to 2050

Despite the absence of official facts and figures on this topic, it is nonetheless possible to cast a spotlight on the changing terrain of family ties in China. We can do so through *modeling*—that is, by running a statistical simulation of China's population trends from 1800 to the present and projecting these into the future. In doing so, we “build” a nationwide compilation of family trees that is consistent with the country's past and future patterns of birth, death, marriage, and divorce (using historical demographic estimates for the past and UN population projections for the future).³

Such a simulation cannot provide perfect accuracy, but it offers a close approximation of actual kinship patterns—now, in the recent past, and into the near future. Using the resultant data, for instance, we can examine whether individuals in the simulation experienced demographic patterns similar to those used as inputs into the model.

Figure 1 contrasts the fertility patterns among women in the simulation against historical estimates and projections of fertility per woman in

Figure 1. Fertility Estimates for China in the Simulation and in UN Estimates and Projections

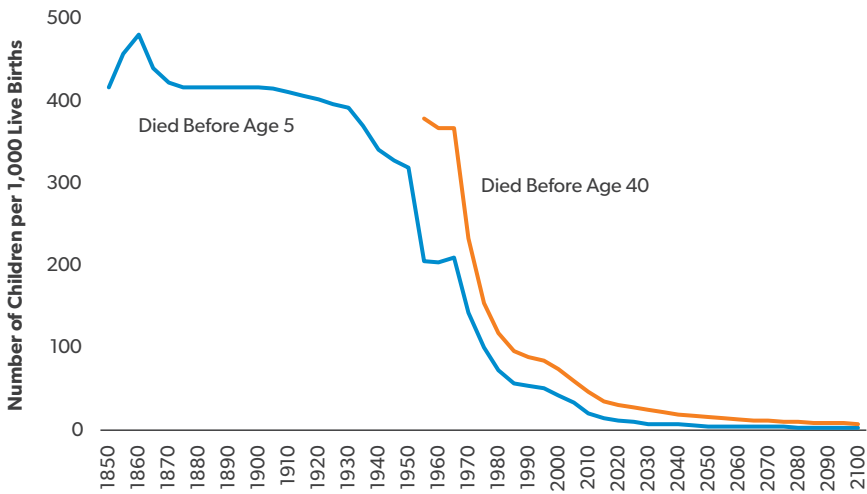


Source: Authors' calculations; and UN Department of Economic and Social Affairs, Population Division, *World Population Prospects 2019: Highlights*, June 17, 2019, <https://www.un.org/development/desa/publications/world-population-prospects-2019-highlights.html>.

China from the UN and other sources. The close correspondence between these quantities suggests that the model faithfully reproduces this and other aspects of Chinese history. (A more in-depth evaluation of the model's accuracy is available in prior work.)⁴ Such simulated data not only faithfully reproduce China's demographic trajectory but also reveal previously unseen implications of these patterns. Modeling Chinese family structure has long been possible in principle, but the work is highly technical, time-consuming, and tedious—perhaps explaining why it has not been attempted previously.

Our simulations reveal striking—and surprising—findings for the recent past and the decades ahead. One immediate, and highly counterintuitive, result concerns China today, for it appears we are living through the era of “peak family” in mainland China *just now*, rather than in earlier times.

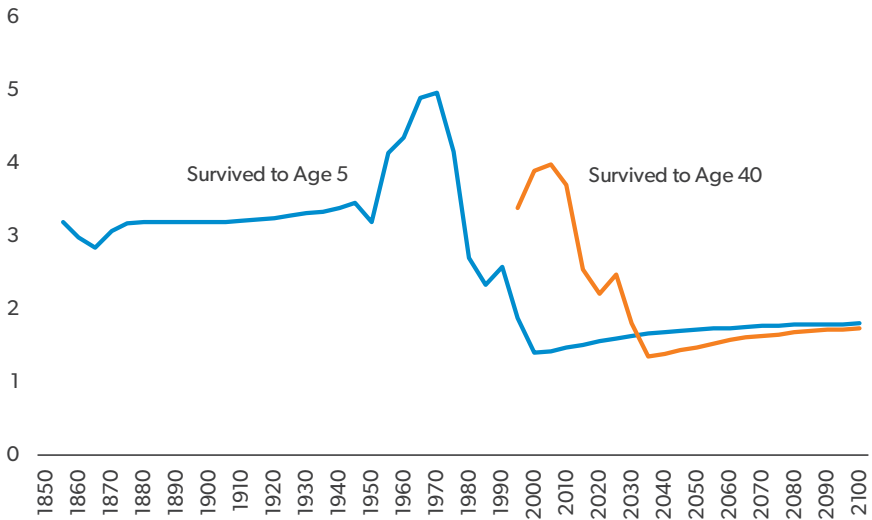
Figure 2. Select Mortality Indicators per 1,000 Live Births in China



Source: UN Department of Economic and Social Affairs, Population Division, *World Population Prospects 2019: Highlights*, June 17, 2019, <https://www.un.org/development/desa/publications/world-population-prospects-2019-highlights.html>; and Aaron O'Neill, "Child Mortality Rate (Under Five Years Old) in China from 1850 to 2020," Statista, June 21, 2022, <https://www.statista.com/statistics/1041851/china-all-time-child-mortality-rate>.

The received view of traditional China, of course, is that young and old alike typically had a large contingent of siblings, cousins, and other relatives on whom they could rely and who conversely could come to them for assistance. This seems to make sense since we know that birth rates were high in China under the old order (with common norms of five births or more per woman, as shown in Figure 1). Yet while births may have been plentiful, live kin were much scarcer, given the poor survival rates of the past, with many children dying before they could talk, play, or take on the roles of, for all intents, siblings, cousins, or other relatives.

Figure 2 shows two indicators of China's mortality conditions over 1800–2100, based on historical estimates and future projections.⁵ The first indicator is the under 5 mortality rate, which shows one of the biggest contributors to deaths in high-mortality environments and which is available for the entire period of interest. The second indicator is the under 40

Figure 3. Implied Surviving Children per Woman in China

Source: Authors' calculations.

mortality rate, which highlights the likelihood that children become adults; it is unfortunately only readily available for the modern period.

Figure 3 offers a simple way of thinking about the coupled dynamics of China's historical fertility and survival patterns. It graphs the implied numbers of children surviving to ages 5 and 40, produced by multiplying the number of births per woman either five or 40 years prior against the comparable survivorship statistics (the reverse of the mortality rate) in that year. As shown, the average number of children expected to survive to age 5 peaks in the 1970s, and the number expected to survive to age 40 follows a similar but displaced pattern—reaching its observed peak in the 2010s. These results highlight that only in the current era have very high numbers of surviving adult children been available to older adults.

Surviving children are, however, only one component of family structure, albeit a vital one. What about other kin types?

The measures in Figure 2 are crude and necessarily limited by data availability. They are not well-suited to examine counts of other kin types. For

that, we need to turn to the simulation results. Tables A1–A6 contain full estimates, and here we discuss some key points.

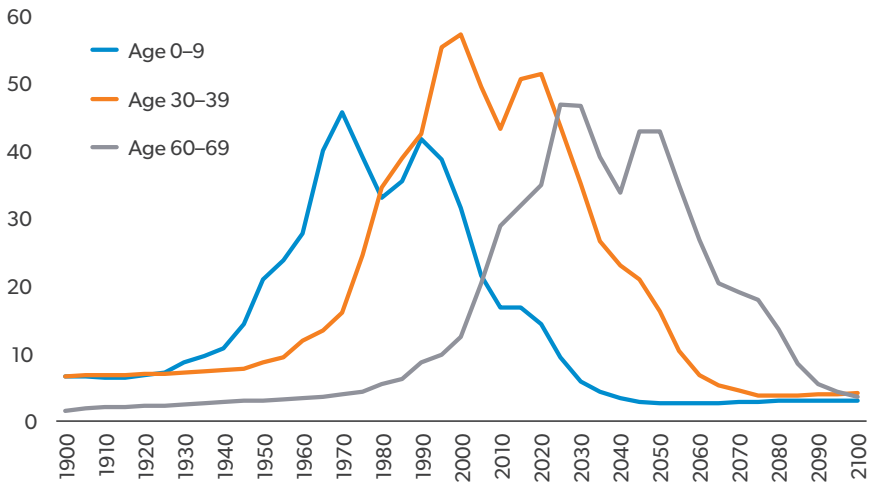
As recently as 1950, we estimate, only about 7 percent of Chinese men and women in their 50s had any living parents; the corresponding figure today (i.e., 2020) would exceed 60 percent (Table A1). Conversely, a decidedly larger fraction of Chinese men and women in their 70s and 80s have two or more live children today than around the time of the 1949 “liberation” (Table A2); they are also more likely to have a living spouse nowadays than in that much less developed era (Table A6).

By our estimates, men and women in their 40s are three times more likely to have two or more living siblings today than they were in 1950 (Table A3). In 1950, by our reckoning, only one in four Chinese in their 30s had 10 or more living cousins; today that share would be an amazing 90 percent or higher. And practically none of today’s 30-somethings lack cousins altogether, as opposed to about 5 percent of their counterparts in 1950 (Table A4).

Despite 35 years of coerced anti-natalism through Beijing’s notorious One-Child Policy (1980–2015), today’s teens in China are more likely to have 10 or more living cousins and vastly more likely to have 10 or more living uncles and aunts than their predecessors in 1950 were (Table A4). In fact, 10 or more cousins and 10 or more uncles and aunts looks to be the most common family type for teens in contemporary China (Table A5).

Figure 4 displays the simulation-derived average number of cousins for three age groups over 1900–2100. It reveals two key results. The first is that the present era contains vastly more cousins, for people of all ages, than prior eras did or subsequent ones will. The century beginning in approximately 1950 and ending in approximately 2050 is a century of cousin abundance for the majority of the population.

The second point these trends drive home is that the rolling increase in family members begins, peaks, and ends in different age groups at slightly different times. The cousin increase is what demographers call a cohort effect—a persistent characteristic shared throughout their lives by a group of people who were born at the same time. As cohorts with more and more cousins are born, age, and die off, the averages rise to new heights and then fall back to historical levels.

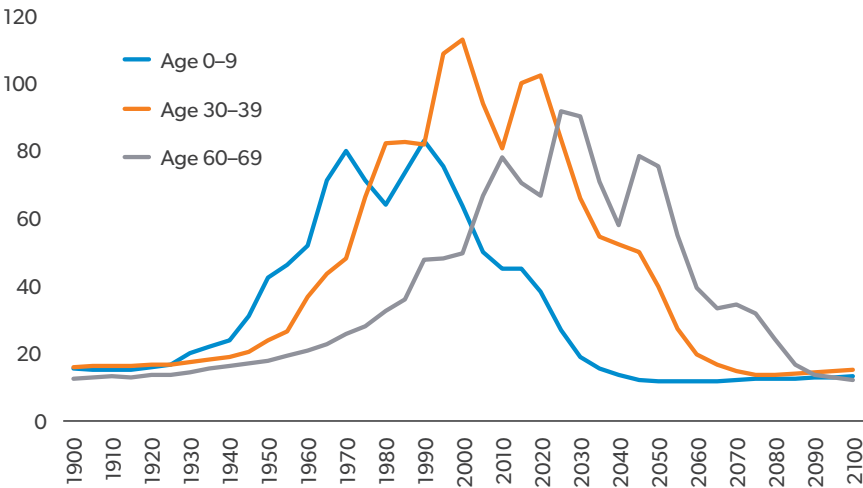
Figure 4. Average Number of Cousins for People in Different Age Groups in China

Source: Authors' calculations.

Our estimates obviously cannot speak to the (possibly changing) quality of familial relations in China, but in terms of sheer quantity, it seems safe to say that Chinese networks of blood kin have never been nearly as thick as they were at the start of the 21st century. Figure 5 confirms this suspicion by adding the annual average counts of parents, children, siblings, spouses, grandparents, grandchildren, aunts and uncles, nieces and nephews, and cousins for people of different ages; the results largely parallel those for cousins in Figure 4, though they are more diffuse and intense. This proliferation of living relatives is a confluence of three driving forces: (1) the tremendous general improvement in life expectancy starting seven decades ago, (2) the generationally delayed impact of steep fertility declines on counts of extended kin, and (3) the as-yet-modest inroads of the “flight from marriage” (to borrow a phrase from Gavin W. Jones⁶) witnessed already in the rest of East Asia, as well as affluent Europe and North America.

Although unrecognized as yet by researchers and decision makers inside China and abroad, China has evidently enjoyed a massive “demographic

Figure 5. Estimated Total Kin for People in Different Age Groups in China

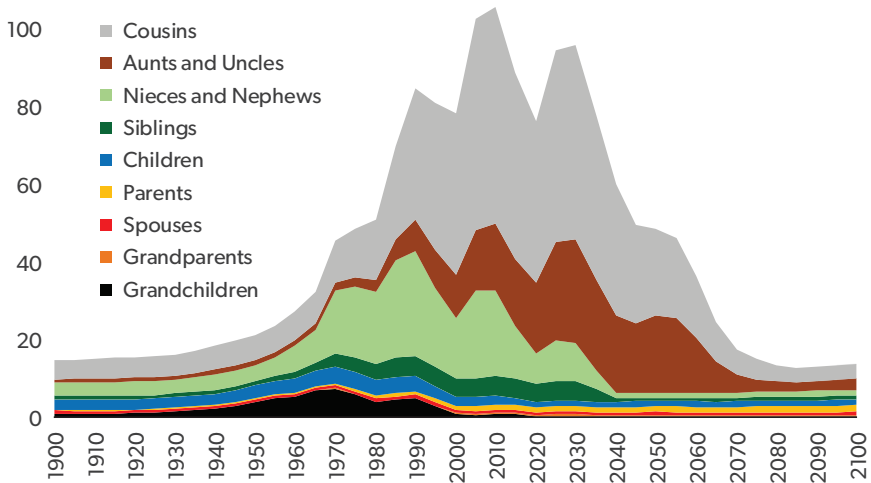


Source: Authors' calculations.

deepening” of the extended family over the past generation or so—a deepening with many likely benefits, not least an augmentation of social capital. This deepening is driven by increases in both close and extended kin relations, though the latter numerically dominate owing to how numerous certain types of extended relatives can be—especially in the current period when the size of cousin sets has exploded.

Figure 6 graphs the demographic deepening of ties for 40-year-olds over the period, breaking down the total kin numbers into different types of kin. Extended kin are the notable aftershocks of trends driven by close kin. Even as numbers of kin have skyrocketed, the timing of these patterns is not uniform and reflects the aging of different cohorts through the life cycle.

First, average numbers of children, siblings, grandchildren, and nieces and nephews increase rapidly; then average numbers of cousins hit their peak; and then as these decline, aunts and uncles hit their peak. The drops are steeper than the increases. If we picked a different age group, we would see a variation on this theme—and more prominent roles played by different

Figure 6. Estimated Total Kin, Broken Down by Kin Type, for People Age 40–49 in China

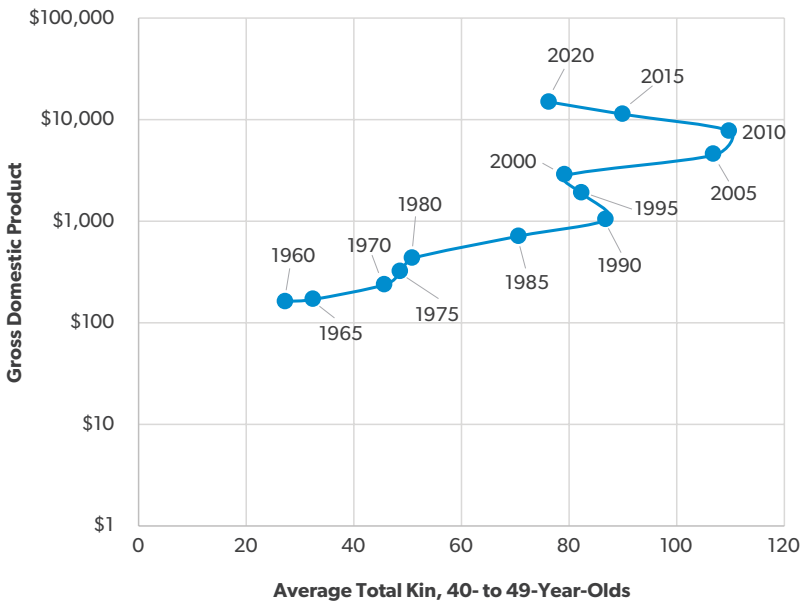
Source: Authors' calculations.

kin types (e.g., few aunts and uncles for those in their 80s and few nieces and nephews for those in their 20s), but the general story would be the same.

Social capital begets economic capital. China's "kin explosion," for instance, may have had highly propitious implications for *guanxi*, the quintessentially Chinese kin-based networks of personal connections that have always been integral to getting business done in China. With a sudden new wealth of close and especially extended relatives on whom potentially to rely, the outlook in China for both entrepreneurship and informal safety nets may have brightened considerably—and rapidly—in post-Mao China, as numbers of working-age siblings, cousins, uncles, aunts, and other relatives surged for ordinary people.

It is intriguing that China's breathtaking economic boom should have taken place at the very time that the country's extended family networks were becoming so much more robust. No one has yet examined the role of changing family structure in China's dazzling developmental advance over the past four decades.⁷ But there is good reason to suspect that family dynamics are integral to the propitious properties of the much-discussed

Figure 7. Association Between GDP (Constant 2015 Billions of Dollars) and Total Numbers of Kin for 40- to 49-Year-Olds in China



Source: Authors' calculations; and World Bank.

“demographic dividend” in China and other Asian venues. If so, the family would be a crucial though unappreciated element in contemporary China’s socioeconomic rise, and this unobserved variable may require some rethinking of China’s modern development, both its recent past and its presumed future.

It is easy to misinterpret two correlated trends, but the empirical link between China’s gross domestic product (GDP) growth and its kinship explosion in the latter half of the 20th century and beginning of the 21st century is quite notable. Figure 7 shows a scatterplot of the relationship between China’s GDP (from the World Bank, in constant 2015 billions of dollars, logged to fit on the graph) and the number of total kin available to 40-year-olds (per prior analyses). The year of each measurement is labeled, and the line connects the markers in temporal order to help visualize the trends.

The association between GDP levels and kin availability at midlife was quite strong from 1960 to 2010. The correlation between these numbers over this period was 0.86. (The logged correlation shown in the graph is even stronger, at 0.97, or nearly perfect.) After 2010, total kin numbers begin declining, but GDP keeps rising, even more dramatically than previously, weakening the correlation somewhat. Of course, we are not arguing that China's revolution in family structure is the sole cause of its economic growth, but our reading is that the evidence is strong enough to merit further investigation of its possible catalyzing effects.

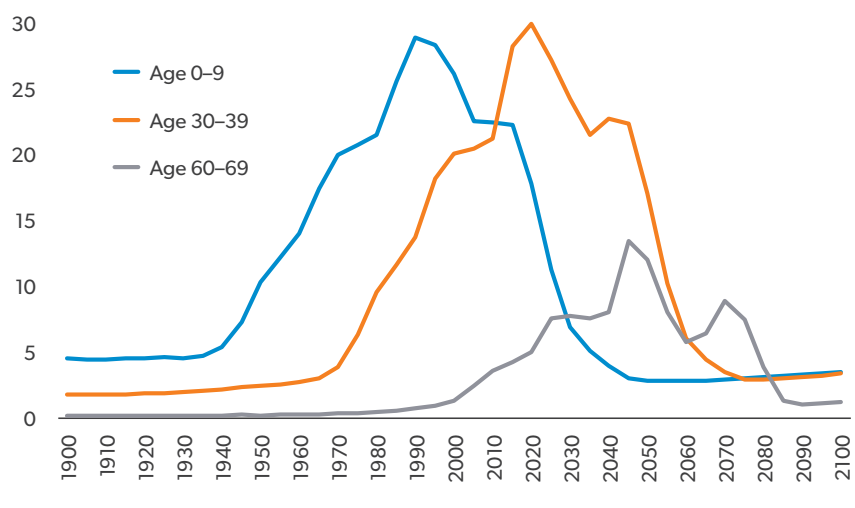
The Implosion of China's Extended Family Networks

For better or worse, however, our metrics indicate that the extended family in China, at least as a consanguineous or blood-ties proposition and the affinal supplements gained by marriage, has already reached its quantitative zenith. Families in China are not only aging but shrinking—and at an accelerating pace. After our recent golden age of traditional kinship networks for China, a veritable implosion awaits.

Let's look at some particulars from our projections, peering out to 2050—roughly a generation hence. (We could crank out projections indefinitely, but once we start guessing about babies for the currently unborn, we are into the realm of science fiction.)

To begin: The number of living cousins for Chinese under age 30 is about to crash. Just three decades from now, young Chinese on average will have only a fifth as many cousins as young Chinese have today (Figure 4). By 2050, according to our estimates, almost no young Chinese will live in families with large numbers of cousins (Table A4). Between now and 2050, the fraction of Chinese 20-somethings with 10 or more living cousins is set to plummet from three in four to just one in six.

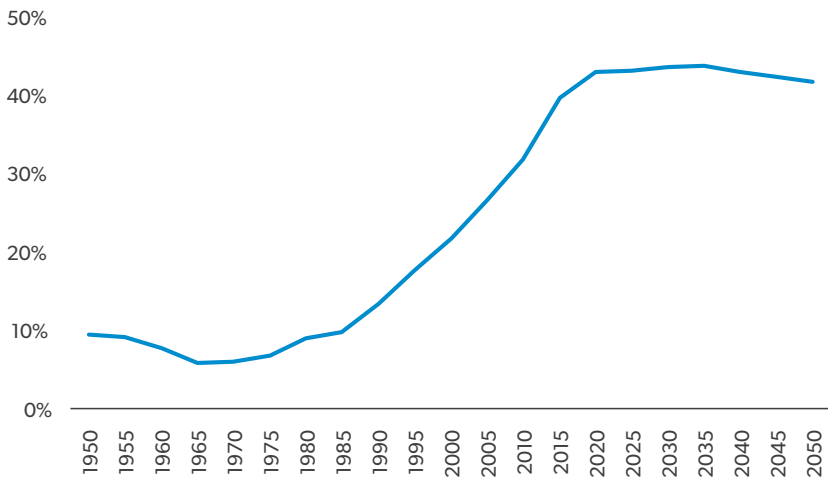
The situation promises to be even starker for the youngest in 2050, Chinese boys and girls under 10 years of age. Barely 1 percent of those children would have 10 or more living cousins. On the other hand, a significant fraction of future birth cohorts will have no cousins at all: By 2050, almost one in six will share this fate during their young childhood.

Figure 8. Estimated Numbers of Aunts and Uncles for People in Different Age Groups in China

Source: Authors' calculations.

So far as we can tell, this “cousin famine” is a completely new demographic development for China. The recent “golden era of the family” in China was historically anomalous, as noted. Yet our models suggest Chinese born after 2035 may well end up with distinctly fewer living cousins than at any previous juncture in Chinese history—barely half as many, for example, as in 1950, a year arguably representative of China’s “traditional” demographic past (Figure 4).

A highly similar collapse looks to be in store for Chinese networks of uncles and aunts (Figure 8 and Table A5). Currently, over two-thirds of China’s 20-somethings have blood ties with 10 or more living aunts or uncles; by 2050, this will fall to one in seven, while one in eight will by our estimates have no uncles or aunts at all. Here again the situation looks to be even more acute for China’s youngest: Just 1 percent of those under age 10 by 2050 would have 10 or more uncles or aunts, while nearly a sixth would have none at all. A life without any aunts, uncles, or cousins promises to be the coming reality for a growing minority of Chinese—and the average numbers of aunts and uncles will soon be not only vastly lower than today but also significantly lower than even times remembered as “traditional.”

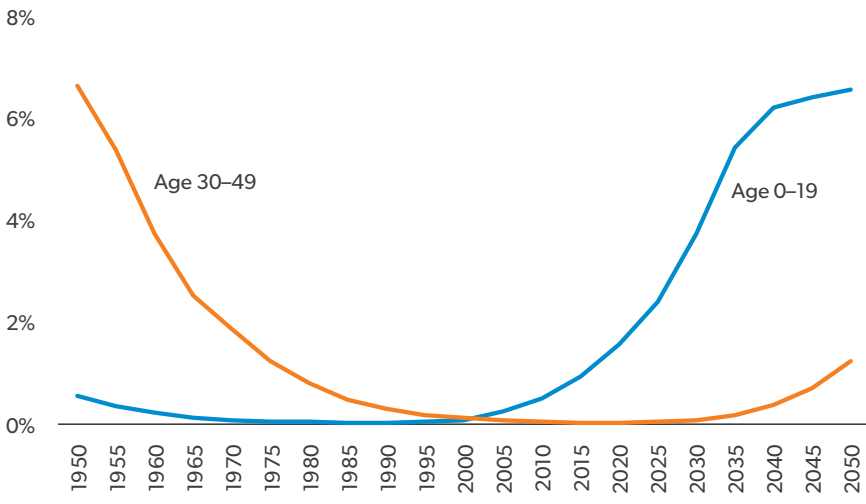
Figure 9. Proportion of Those Age 0–29 in China Without Living Siblings

Source: Authors' calculations.

Then there are siblings. In earlier times, it was highly unusual for young people to have no living brothers or sisters, high death rates and low child survivorship notwithstanding: In 1950, by our simulations, less than a tenth of Chinese under age 30 had no siblings at all (Table A3). Today, by contrast, nearly half of China's children under age 10—47 percent by our model—have neither brothers nor sisters; only a tiny fraction have two or more. *By 2050, we project that roughly two-fifths of all Chinese under age 50 will have no siblings, while only a negligible fraction will have two living siblings or more.*⁸ This staggering growth in the proportion of the population without living siblings is shown in Figure 9.

Almost all the sibling-less 30- and 40-somethings in China in 2050 will have cousins, uncles, and aunts, as shown in Figure 10. Not so for that decade's Chinese youth: By then, a small but growing share of China's children and adolescents will have no brothers, sisters, cousins, uncles, or aunts. Still more sibling-less young people will have just one or two such kin. Thus, a significant minority of this coming generation in China—many tens of millions of persons—will be traversing life from school through work and on into retirement with little or no firsthand experience of the Chinese extended family, the tradition hitherto inseparable from

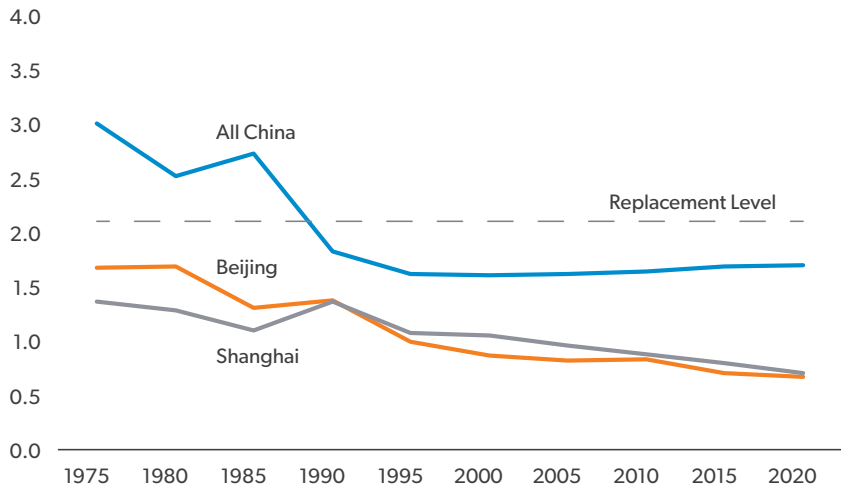
Figure 10. Percentage of Youth (Age 0–19) and Adults (Age 30–49) in China Without Siblings, Cousins, Uncles, or Aunts



Source: Authors' calculations.

China's very culture and civilization and experienced most acutely in fullest measure in the decades just now completed.

By the way, kinless young Chinese are most likely to be residents of China's biggest cities and are likely to comprise a substantial proportion of the population in Beijing, Shanghai, and other centers of Chinese economic and political power. In China's biggest cities, fertility levels have been far below replacement since the 1970s. According to one study of Chinese birth patterns undertaken by the China National Bureau of Statistics and the East-West Center in Hawaii, for example, in 1976—the year of Mao's death—total fertility rates in Beijing were just 1.5 births per woman per lifetime, and Shanghai's were barely 1.4.⁹ These trends have persisted, and large cities in China have some of the lowest fertility rates in the world. (See Figure 11.) According to “parity progression ratios,” based on the likelihood that women have an additional child, from that study, about three-fourths of the children born in Beijing and Shanghai in 2000—20-year-olds today—would have been only children.¹⁰ China's future elite, likely drawn disproportionately from this population, may find themselves rich in material resources, but they will be strikingly poor in kin.¹¹

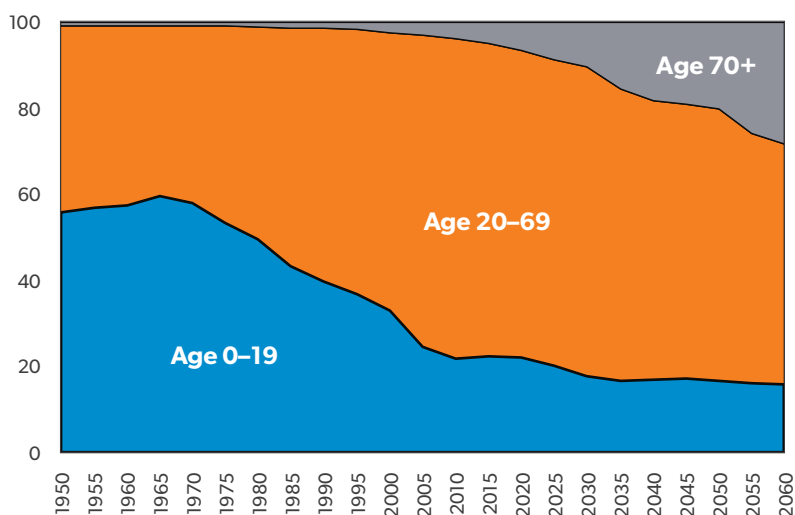
Figure 11. Fertility Rates in China and Select Cities, 1975–2020

Source: UN Department of Economic and Social Affairs, Population Division, *World Population Prospects 2019: Highlights*, June 17, 2019, <https://www.un.org/development/desa/publications/world-population-prospects-2019-highlights.html>; M. Giovanna Merli and S. Philip Morgan, "Below Replacement Fertility Preferences in Shanghai," *Population* 66, no. 3–4 (2011): 519–42, <https://www.cairn-int.info/journal-population-2011-3-page-519.htm>; and authors' interpolations and extrapolations.

A Confucian Society's Unprecedented Filial Burden

As China's extended kinship networks wane and disintegrate, the condition of the nuclear family—parent and child—necessarily attracts enhanced scrutiny. Radical change is afoot here as well, and its importance will be magnified by the great graying ahead for Chinese society. The percentage of the Chinese population over age 65 is on pace nearly to triple between now and 2060, from 13 percent in 2020 to 35 percent in 2060.¹² Figure 12 shows historical and projected trends in China's age distribution according to the US Census International Database.

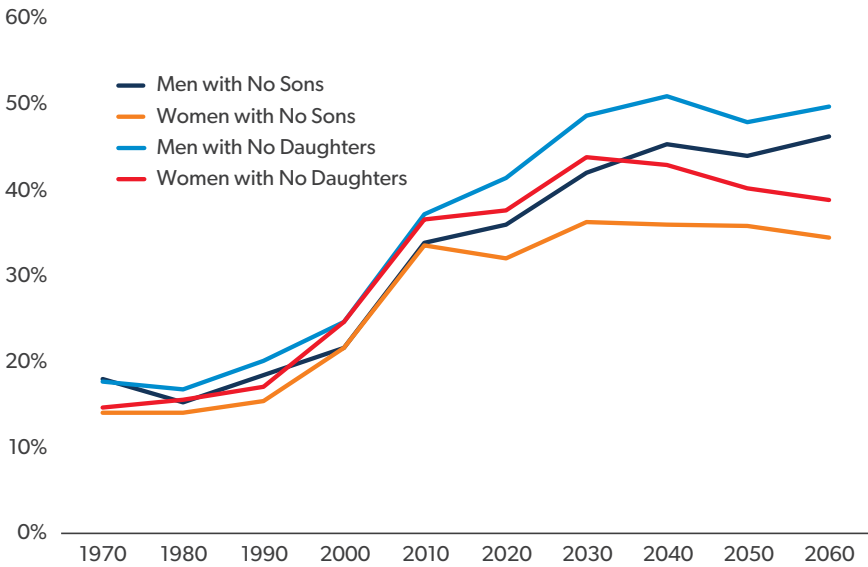
Today four in five Chinese men and women age 70 and older have two or more living children to turn to for their prospective support and care (Table A2). And that prevalence of grown children is fortuitous, since

Figure 12. Trends in the Percentage of China's Population in Different Age Groups

Source: US Census Bureau, International Database, https://www.census.gov/data-tools/demo/idb/#/country?COUNTRY_YEAR=2022&COUNTRY_YR_ANIM=2022.

today, much as in the past, China's primary social security system for old-age support is the family. Some privileged urban retirees enjoy relatively generous pensions, but most do not: In the countryside, penurious rural pensions officially guarantee an income of less than \$100 US a year, not nearly enough to live on. For China as a whole, according to one economic study, personal earnings plus public benefits cover just three-fifths of current living costs for those age 65, a mere two-fifths for those 75 years of age, and well under a third for those 80 and older;¹³ the rest comes from the fruits of the family tree.

But the branches on the family tree have already been severely clipped for tomorrow's seniors: By 2050, just two in five will have two or more children, and a growing share will have none at all (Table A2). Half (49 percent) of China's 60-somethings in 2050 will have only one living child, meaning that a large share of China's older population will necessarily have either no sons or no daughters.

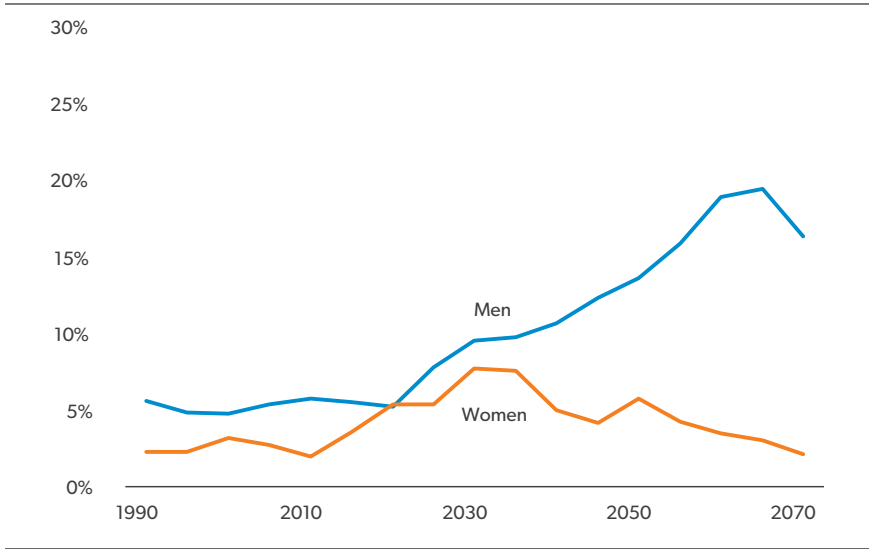
Figure 13. Percentage of 60- to 69-Year-Olds in China Without Sons or Daughters, by Sex

Source: Authors' calculations.

Figure 13 shows trends in the percentage of men and women age 60–69 with no living sons and no living daughters from the start of China's fertility control campaigns (in the 1970s) to 2060. From the end of the 1990s to about 2010, there is an increase in the number with no sons and no daughters that is felt about equally by men and women; this is driven by China's initial fertility declines in the 1960s and early 1970s. (That is, those age 65 in 2000 were born in 1935 and in the midst of their reproductive years in 1960.) After 2010, there is a sharp divergence between men and women in terms of whether they have no living daughters or no living sons. This gap emerges in 2010 and widens sharply until 2030, after which it changes less dramatically.

By our simulations, in fact, just about half of China's men in their 60s in 2050 would have no biological daughters at all; nearly half would have no surviving biological sons. The situation would not be quite as extreme for women; even so, in 2050 about two-fifths of China's female 60-somethings

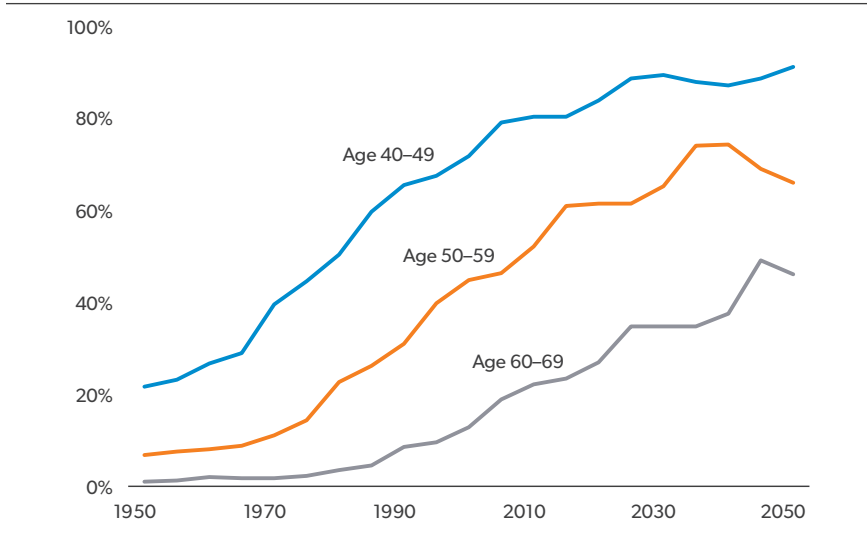
Figure 14. Simulated Percentage of Older Adults in China with No Living Children, by Sex



Source: Authors' calculations.

would have no daughters, and over a third would have no living biological sons. These trends are exacerbated by collapsing marriage rates in the younger ages, particularly for sons (in a best-case scenario, 15 percent of today's young Chinese men will never marry), which will lead to a daughter-in-law deficit for many older families.

In this future China, older men are more likely on average to have fewer children than older women are—and more likely to have no children at all (Table A2). We can expect big disparities in childlessness between male and female seniors by 2050—a surging population of elderly bachelors being a long-delayed consequence of the “war against baby girls” from the One-Child Policy era.¹⁴ Today just 5 percent of China's men in their 70s have no living offspring, but our simulations suggest that share will rise to 14 percent by 2050 and 19 percent by 2060 (while the corresponding rate for women will fall to 3 percent). Figure 14 highlights these trends for those in their 70s; the great divergence between men and women in this age group is likely to begin around 2030 and persist for at least several decades. Given China's low rates of childlessness within marriage, the

Figure 15. Percentage of Middle-Aged People in China with at Least One Living Parent, by Age Group

Source: Authors' calculations.

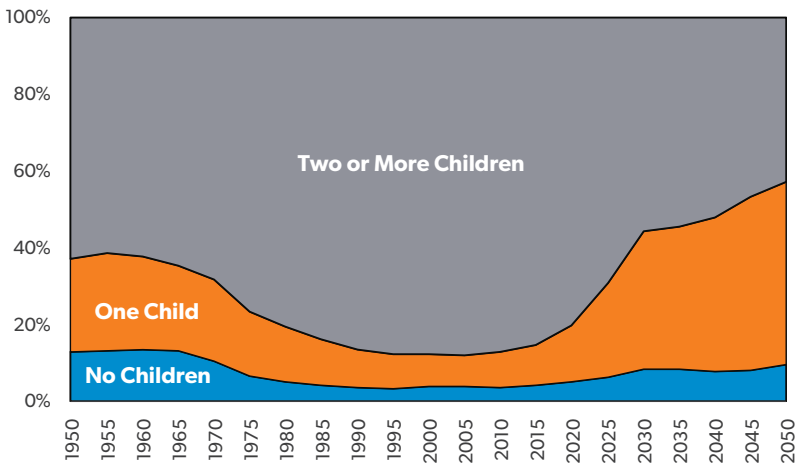
increase in men without children is primarily driven by increases in men who fail to marry.

Large numbers of kinless elders (most of them men) will be one face of China's emerging new family structure.¹⁵ Another will be the extraordinary new obligations looming for the care of aging parents. The overwhelming majority of middle-aged Chinese in 2050 will have elderly parents, many of them dependent in various degrees despite presumed health improvements and potential changes in China's pension systems in intervening decades.

For middle-aged adults in China, Figure 15 shows these trends. By 2050, over 90 percent of men and women in their 40s would have at least one living parent, and nearly three-fifths would have two (Table A1); thanks to improved longevity, nearly two-thirds of China's 50-somethings and half its 60-somethings would likewise have at least a surviving mother or father, sometimes both.

Thus an immense, but also highly uneven, filial burden awaits this generation of middle-aged children. By 2050, more than half of China's women

Figure 16. Percentage of 70- to 79-Year-Olds in China by Numbers of Children



Source: Authors' calculations.

age 70 and older and just under half its men will have just a single living child (Table A2). Figure 16 highlights the dramatic surge in only children among this age group in the coming decades. A substantial minority of this generation of middle-aged children will be only children (or sole surviving children)—and at some point most of these middle-aged only children will have not just one but two living parents as core family.

Further, for only children who marry only children, many or most will find their middle age shaped by consideration of their four aged parents and in-laws. Thus the “4-2-1” family unit in China is poised to make its way from classroom sociological curiosity to an unexceptional everyday mode of life in China by 2050. For those who do not marry (mostly men), they face this burden alone. Future research needs to consider what the 4-2-1 family might look like and how it might differ for grandchildren compared to grandparents.

We should emphasize that the vision of China’s demographic future depicted above is not based on selective, barely plausible assumptions. To the contrary, our projections might actually prove “optimistic”; family

trees in China could end up even more shriveled, distorted, and top-heavy a generation from now.¹⁶ After all, these simulations do not account for the unique circumstances of the COVID-19 pandemic in China—whose impacts on fertility behaviors and other aspects of demographic life are only beginning to be known.

And as discussed above, trends since the 2019 revision to the United Nations' World Population Prospects, whose projections underlie our simulations, suggest that actual counts of births have successively come in *far below* the levels the UN expected in 2019.

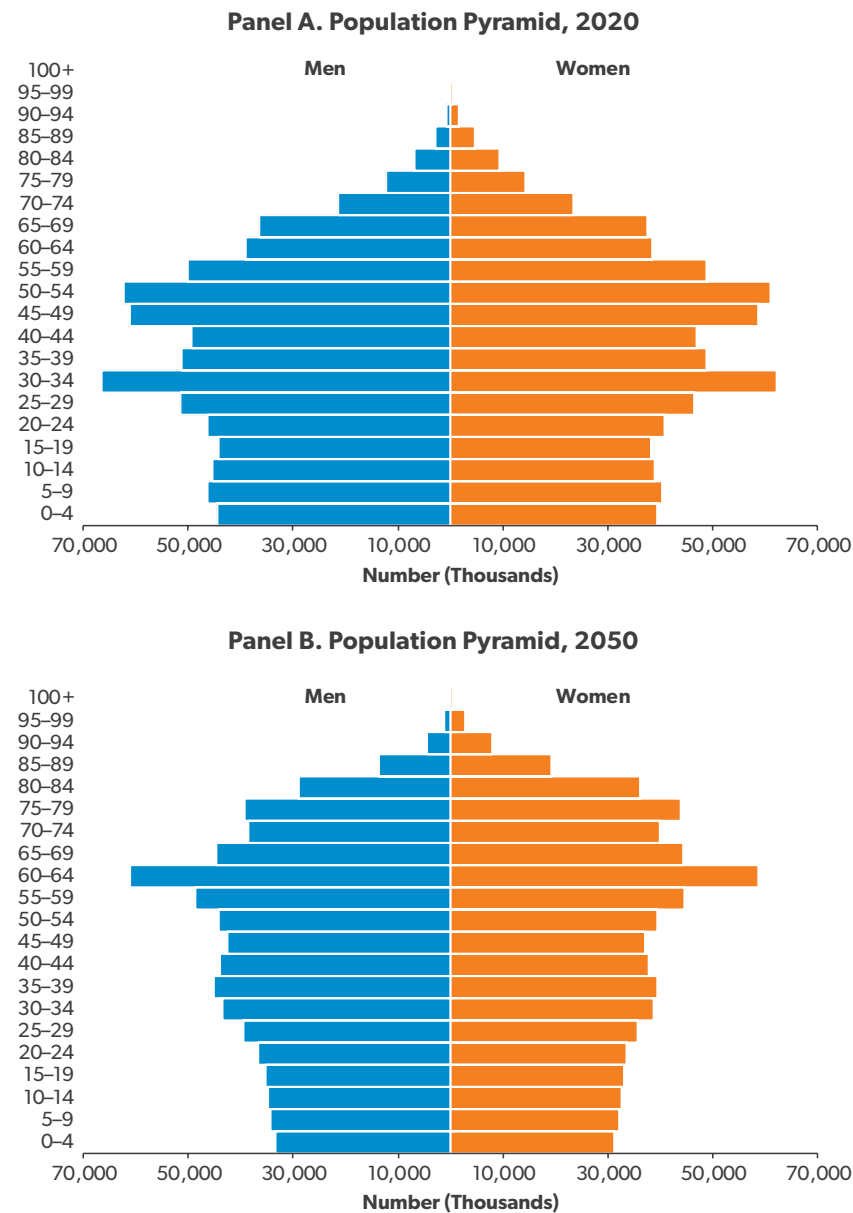
China in 2050: A Social Structure Unlike Any Previously Known

Today it is virtually certain that China's population in 2050 will be gray (with a median age approaching 50—and perhaps exceeding it) and shrinking (working-age manpower may fall by nearly 200 million between now and 2050) and that the family networks linking its people together will be rapidly disintegrating. Figure 17 shows just how quickly China's age structure is changing by contrasting its population pyramid in 2020 against the projected population pyramid in 2050. In the upside-down population pyramid for China in 2050, men and women in their early 80s will outnumber children under age 5—and China's extended families will be dying not from the top down but from the bottom up. Perhaps for the first time in human experience in large-scale societies, elders will have many more living contemporary kin than their grandchildren do.

Our simulations for 2050 show, for example, that China's 80-somethings will average almost 10 times as many *living* siblings and cousins as boys and girls 80 years younger (Tables A3 and A4). Moving down through China's population structure in 2050 from the older working ages to the country's youngest members, blood cousins and siblings become progressively rarer—and for those at the bottom of the age pyramid, the missing siblings and cousins are not departed relatives but relatives never born.

A significant minority of China's youth in 2050 will have a lineage entirely bereft of brothers and sisters, uncles and aunts, and cousins (Figure 10). For them, such relatives will be imaginary creatures, perhaps akin to the wonderful unreal figures from fairy tales and children's stories,

Figure 17. Population Pyramids for China in 2020 and 2050



Source: UN Department of Economic and Social Affairs, Population Division, *World Population Prospects 2019: Highlights*, June 17, 2019, <https://www.un.org/development/desa/publications/world-population-prospects-2019-highlights.html>.

never to be encountered in real life. Theirs will be the generation that in effect finds 2,500 years of Confucian tradition coming to an end.

The familial terrain in 2050 and beyond for China-to-be sounds unlike anything humans have yet seen—so different, in fact, that understanding how it will function on a daily basis, or operate more generally, strains today's imagination. (Indeed, the “science” offering insight into the workings of this place just over the horizon may not be social science but rather science fiction, which regularly envisions distant worlds.) Even so, it is apparent that the coming revolution in family structure must presage profound and far-reaching change for China's society and economy—and may recast geopolitical realities.

Although we may today fail intuitively to understand much about the new way of life that lies immediately ahead, we can already point to some of its most obvious consequences and uncertainties.

The Social Outlook

We can expect China's coming revolution in family structure to overturn fundamental social arrangements taken for granted today. The focus of the family (or what is left of it) in China will necessarily be redirected from the rearing of the young to the care of the old. With rapidly shrinking kinship networks to effectuate such care, the reliability and durability of China's age-old familial bonds of duty will be an increasingly crucial question—perhaps even a matter of life and death for many, including frail and impecunious elders in the Chinese hinterlands. Will tomorrow's middle-aged “little emperors,” who will have spent their young lives lavished with attention and favor by their elders, be ready to accept a heavier weight of sacrifice in prospective parental care than that borne perhaps by any previous generation in Chinese history?

Trust—more particularly, *warranted* trust—is the crucial unknown here. The implosion of China's extended family networks over the coming generation cannot but portend a nationwide decline in social capital.

Historically, trust—more specifically, trust *beyond the confines of the family*—has always been in scarce supply in China. But human beings are resilient and highly adaptable social animals: How much of the social

“space”—and need—suddenly exposed by the rapid retreat of the family will be filled by alternative “fictive kinship” relationships in China? Can friends, colleagues, and comrades approximate the support lost for those who will never know a blood sibling or cousin of their own?

The informal social arrangements known as *guanxi* are as old as Chinese civilization and seemingly indispensable to it—but these networks of personal ties for human security have never been exclusively consanguineous. Can *guanxi* networks comprised mainly of “blood brothers” passably substitute for *real* brothers who will never be?

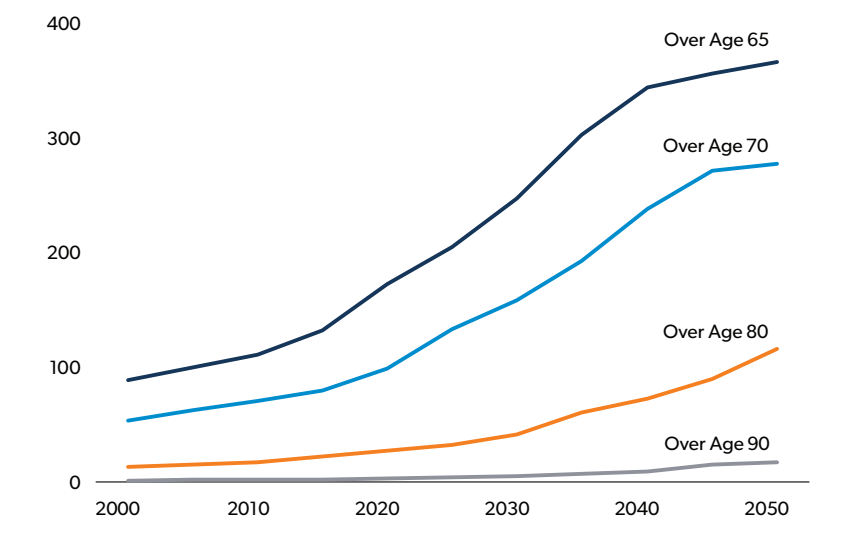
Technological advances, from the promising opportunities of fintech to the dark new state weapon of “social credit ratings,” may also plug *some* of the social-capital gaps opened by the decline of the Chinese family. Some—but not all. From our vantage point, it is difficult to conceive of a world where people are so malleable—or so adaptive—that a decay of family networks on the order of the one coming to China would make no difference at all.

The issue, then, would seem to be not whether the social impact will be adverse but instead precisely how adverse. No matter how much material advance such a society might enjoy, the shrinking, aging, “de-familizing” China of 2050 sounds like a profoundly pessimistic place—and pessimistic expectations could shape popular behavior in myriad ways, many of which we may not yet imagine.

The New Economics of a Family-Less China

Not all the economic implications of the coming revolution in family structure are negative for China. For example, with many fewer children in relation to the adult population than today, much less a generation ago, young people will presumably benefit from their relative scarcity through augmented investment in education and other forms of human capital.

But China’s elderly will vastly outnumber its children by 2050: UN projections suggest the 75-plus group alone will match the under-15 population that year, and projections by other reputable authorities suggest they will substantially exceed it.¹⁷ By 2050, China is likely to have well over 100 million octogenarians and nonagenarians and over 360 million men

Figure 18. Number of People of Different Ages in China, in Millions

Source: UN Department of Economic and Social Affairs, Population Division, *World Population Prospects 2019: Highlights*, June 17, 2019, <https://www.un.org/development/desa/publications/world-population-prospects-2019-highlights.html>.

and woman above age 65 (Figure 18). This group will consume far more than it earns—and unlike net expenditures on the young, transfers to support this vast population cannot in any economic sense be described as an investment in future production.

Truly immense intra-family resource transfers will be required to sustain the vast and growing population of aged dependents in China in 2050, straining household finances for many tens of millions of working-age children. But those familial subventions may not fully meet the needs of many aged dependents—to say nothing of the precarious and potentially calamitous situation for the many millions of isolated, frail elders with neither close kin nor kin willing to support them. These unfortunates will have to rely on the kindness of strangers to get by. This almost certainly means that a much more expansive and developed set of public social programs for the aged, and by extension a far larger governmental claim on overall national resources, is in the works for China in the decades immediately ahead.

Leaving aside the broad human benefits of such prospective interventions, there is an argument that forcing a major increase in domestic consumption might help “normalize” China’s grossly distorted economy, where private household demand (“final consumption”) reportedly accounted for just over half (56 percent) of overall GDP in 2019, as compared to 81 percent for the US.¹⁸ But a much bigger government is also likely to be yet another factor encouraging slowdown and sclerosis in the future Chinese economy—and other demographic trends promise plenty of this already.

The most consequential economic impact of China’s coming revolution in family structure, however, may not be on macroeconomic balances but on the micro-foundations of the national economy. Since earliest recorded history, China’s *guanxi* networks have helped get business done for the modest and the mighty alike by reducing uncertainty and transaction costs, thereby facilitating economic activity.

The drastic plunge in living biological kin in China between now and 2050 can hardly but be expected to batter the microeconomic foundations of the Chinese economy—savagely. Just as proliferation of blood relatives likely proved a powerful stimulant for growth during the era of China’s phenomenal upswing (albeit largely unrecognized at the time), rapid evaporation of these same networks promises to serve as an economic depressant on their downswing—the braking effects that even new social constructs of “kin-like personal allegiances” seem unlikely to relieve fully.

Since the beginning of written history, most of China’s successful businesses have been family-based and -run. What happens when there are no longer siblings, aunts and uncles, or cousins to count on? Will “friends” always be ready, willing, and able to fill that crucial breach?¹⁹ Really? Perhaps. But then again, perhaps not.

Absent some currently unforeseen means of vitiating the strongly negative economic pressures brought on by the swift and pervasive decline of family networks, China’s coming family revolution might be expected to manifest itself, among other ways, through a broad popular rise in risk aversion and what we might call “economic pessimism.” Such impulses might discourage entrepreneurship worthy of the name, although on the other hand they might be consonant with rent-seeking and short-term bets.

Numerous studies find that the Chinese people have higher risk tolerance than counterparts in other countries, like the United States (one need only look at the casino revenues of Macau), thought to be a feature of the greater cushion afforded by collectivist societies. As the foundations of such risk tolerance erode, will Chinese bets become better hedged? Or will they persist past the point of rationality, when risk-takers have no reasonable fallbacks?

Such risk aversion may also damper mobility—geographic and social. For example, current government social controls (the so-called *hukou* system) oblige most peasants who seek opportunity in urban areas to leave their parents or children behind in the countryside. If *hukou* strictures are still maintained in a future largely denuded of other rural kin, would-be migrants could find it much harder to leave aging parents and young children behind to seek their fortune in the city—setting up a feedback loop in which reduced migration leads to less urbanization, which in turn constricts national economic growth, which then makes for still more risk-averse individual behavior. Migration is a costly act that requires knowledge of opportunities (for jobs, lodging, etc.) and trusted people who can help obtain them. Without kinship networks—without the ability to stay on a cousin’s couch—migration will become riskier, harder, and, almost certainly, rarer.

Unfamiliar New Constraints on Chinese National Power: “Extinction Rebellion” with Chinese Characteristics?

Finally, how do prospective changes in China’s family structure bear on the stability, power, and international reach of the Chinese state? This question seems distinctly more speculative than does theorizing about the social and economic ramifications of China’s changing family patterns. Will a more atomized populace with much more limited kinship networks be more tractable for a Chinese Communist Party (CCP)–style dictatorship? Alternatively, will less social capital and cohesion make these same people that much more difficult to direct and control? Seemingly plausible *ex ante* cases can be marshaled for either position.

For example, autocratic governments often lean on family relations to constrain dissidents’ activities, at home and abroad. Even those

operating in the relative freedom of more open societies must consider the ever-impending knock at their sister's door back home. In the coming generations without sisters—more generally, without susceptible relatives to lean on—the reach for some of Beijing's extant levers of state control will certainly shrink. Conversely, who will dissidents trust? The answer to such questions probably turns on contingent factors, intrinsically unforeseeable 30 years in advance.

That said, ongoing developments in the Chinese family look as if they could complicate and constrain the quest by party and state to amass greater power to deploy at home and abroad—perhaps considerably.

To be clear, the PRC today appears on course to be a decidedly more powerful actor in 30 years than it is now. State power depends on national economic potential and a government's capacity to mobilize that potential for strategic purposes. Prospectively, Beijing would appear to possess some distinct advantages in both these respects. Moreover, China's leadership has given long and careful thought to exactly how it might capitalize on these advantages in the years ahead. But the dissolution of the Chinese family is likely to undercut both economic potential and Beijing's ability to deploy it—and in ways that official calculations have yet to take into account.

Consider, for example, the adverse economic implications of the impending slump in family networks on social capital and thus indirectly on the business climate in China. If Beijing wishes to address this problem, its options are limited—and for an autocracy, rather unattractive. The quintessential element that collapsing kinship networks stand to remove from the Chinese economy is *trust*. How does a dictatorship replenish this intangible popular resource once it is depleted?

Tyrannies can command obedience of their subjects, but they have never been good at forcing subjects to feel trust or evincing confidence in others. True, Beijing is experimenting today with new tools for directing popular behavior through a seemingly gentler new form of “market totalitarianism”; its social credit rating system, for example, intends to mold Chinese citizens' behavior through a whole mesh of little penalties and rewards as the government observes and evaluates their conduct with the help of big data and artificial intelligence. Through such inventive techniques, an unaccountable and feared regime may perhaps (finally) succeed

in impelling its population to *imitate* some of the activities and responses we would expect to see in a genuinely high-trust society—but at least for now, we would guess those tools may only be capable of generating a poor simulacrum of the real thing.

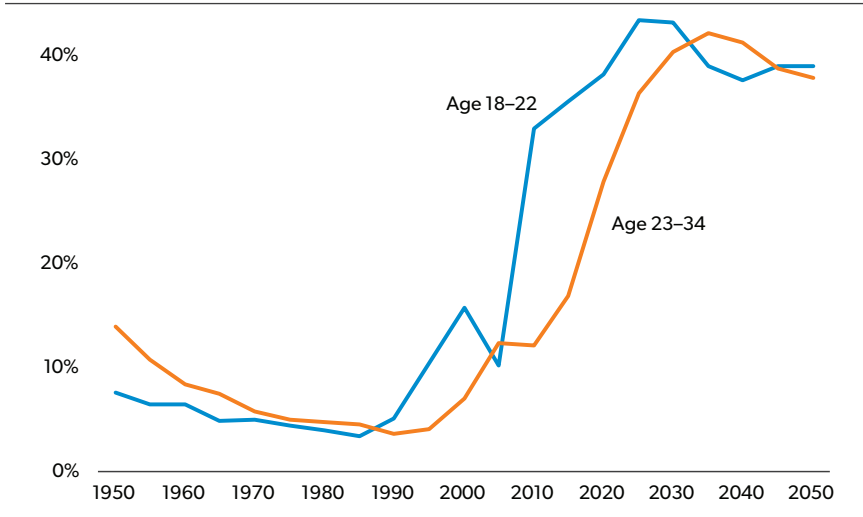
If Beijing actually wanted to get serious about broadly promoting social and economic trust, the pathway is clear. This would involve such things as embracing transparency, acceding to the rule of law, depoliticizing financial and economic decision-making, and otherwise letting civil society take the lead in commerce and economic development.

All of those steps, however, could be highly problematic for an ambitious despotism that wanted to *extend* its sway and authority, rather than systematically cut these back. While such measures would likely elicit sustained material advance eventually—once the credibility of such measures was established—they would also immediately limit the prerogatives and reach of the state. It is not at all clear that the real existing government in Beijing would choose the course that consigns dirigisme to an ever-smaller space in the Chinese political landscape. Indeed, Chinese policy *already* seems to have turned against such liberal impulses, ever since Xi Jinping's rise to supreme power (and, some would say, even earlier).

In any case, a generation hence, China will likely be rather wealthier and more productive than today—but quite possibly not nearly as productive and wealthy as its national directorate currently imagines, due in no small part to intervening demographic headwinds. And if the waning of the family requires China to build a huge social welfare state over the coming generation, as we surmise it will, then Beijing would have that much less wherewithal at its disposal for influencing events abroad through economic diplomacy and defense policy.

Yet the revolution in family structure may check future Chinese foreign and defense strategy still further and in ways that have scarcely begun to receive consideration. One of the most important constraints might be casualty aversion for a population composed largely of one-child families. The dread of such losses could have an unexpectedly powerful impact on Beijing's security policies in the decades ahead. And even though Beijing is no democracy, China's military could face unique popular resistance to such losses.

Figure 19. Percentage of Military-Age Men in China Who Are Only Children



Source: Authors' calculations.

Death in conflict is always a tragedy for the families affected. But in China's cultural heritage, the prospect of one particular kind of death is regarded with special and widespread horror: a death that brings a catastrophic end to one's family line. Since ancient times, Chinese civilization's foundational thinkers (not just Confucius) have taught that continuing the family line through the male is not only an imperative but something akin to a metaphysical duty; by the same token, termination of one's lineage is understood to be an almost unspeakable calamity.

As we already noted, our simulations indicate that by 2030 close to half of China's overall pool of male military-age manpower will be only children. Figure 19 graphs the percentage of males of military age, broken down by the ages of new entrants and those continuing service, who have no living siblings from 1950 to 2050. As can be seen, there is a stark rise in this tendency just now, in the present era. Whereas the past 60 years saw about 10 percent of men in China's military ages being only children, the number is due to rise, in short order, to over 40 percent. Thus, any encounter by China's security forces involving significant loss of life will almost unavoidably presage extinction for many Chinese families.

We can easily imagine circumstances under which such loss of life might be accepted as a necessary price by a patriotic Chinese nation—in defense against a foreign invasion, for instance. But it might be a mistake to presume such sacrifices will always be endured, quietly and unconditionally, by Beijing's long-suffering subjects. Remember the explosion of social rage that shook China in 2008, after parents learned that thousands of school-children had needlessly perished in the collapse of shoddily constructed public schools during the Sichuan earthquake? That spasm—which forced Beijing's leaders out on a rare nationwide apology tour—could be but a foretaste of what the People's Liberation Army (PLA) and the CCP will face at home in the wake of military outings that prove unsuccessful or are otherwise deemed questionable by the populace.

Autocracies are typically casualty-tolerant—but this may not at all be the case in China in 2050. If and when China's possible aversion to combat deaths of only children is generally recognized, China's international security calculations may have to change, perhaps dramatically. Competitors and adversaries may seek to exploit this weakness in their own China contingency plans, reconfiguring their military profiles to expose China to greater risk of casualty-intensive engagements. Beijing, for its part, may need to condition its international posture and its military doctrine to contend with this unexpected vulnerability.

Along China's perimeter and beyond, China's strategic options could be more limited in the future than might be imagined today in a calculus that does not take the coming disintegration of family structure into account. The CCP's hopes and dreams of extending and expanding regional dominance could be seriously qualified by local defenders willing to fight—and draw PLA blood. The prospect of some unfriendly future takeover of Taiwan, for example, might take on a rather different coloration if leaders in Beijing and Taipei did not believe China could stomach the military losses such an operation could entail. Similar points could be made about possible operations in the South China Seas, on the Korean Peninsula, around Japan, or out to the second island chain and beyond.

Broadly speaking, China's credibility as a global actor in great-power politics could come into question in ways not yet anticipated by China's current rulers. Such unanticipated constraints could suddenly alter

Beijing's expectations and behavior, prompting major changes in both domestic and international policy.

Blind Spots, Strategic Surprises, and Net Assessments

For all the reasons we have laid out, failure to contemplate the implications of the upcoming radical changes in Chinese family structure—or even to collect information by which to measure its dimensions—promises to be a costly blind spot for China. It is a blind spot that exposes Beijing to the risk of strategic surprise in the years ahead. Needless to say, the consequences of social, economic, and political risks tend to be greatest when states are not prepared for them.

But every other government today faces this same predicament. All countries today share this blind spot; they have no inkling of what changes in family structure will mean for their societies, economies, or politics over the decades ahead. We know, however, that all countries on earth will be affected by such changes—and that the impact is certain to be greater in some places than others.

By 2050, for example, one analysis of family formation patterns in Japan suggest that nearly two-fifths of Japanese women 60 years of age will be childless—and that just over half of these same women will never have any biological grandchildren.²⁰ Other analyses find that India will face a marriage squeeze quite similar to China's, leading to large numbers of unmarried men entering older adulthood with no spouse and, almost certainly, no children.²¹ In the United States, according to work by yet another research team, rates of older adults without living family are increasing markedly across cohorts, with projections holding that there will be stunning growth in this family form in the coming decades.²²

Thought-provoking as such projections may be, they provide only limited glimpses of the changes in store for family structure in Japan, India, and America. A more comprehensive overview, of the sort we offered here for China, will be required for in-depth national evaluations and, of course, any sort of cross-country comparisons. Until similar diagnoses are conducted for the world's other countries, we will not be able to attempt a net assessment of the differentials the family factor stands to impose in the

geopolitical arena, much less the influence it may exert on the world economy and the tenor of national life in the world of tomorrow.

Appendix A. Specific Breakdowns in Counts of Kin by Age, Sex, and Year

Table A1. Percentage of People in China with Different Counts of Living Parents, by 10-Year Age Group, Sex, and Year

Year: 1950 Age Group	Zero	Men One	Two	Zero	Women One	Two
<10	1%	11%	88%	1%	11%	89%
10–19	6%	35%	58%	6%	35%	59%
20–29	22%	45%	33%	21%	45%	34%
30–39	51%	38%	11%	50%	39%	11%
40–49	78%	20%	2%	79%	19%	2%
50–59	93%	7%	0%	93%	7%	0%
60–69	99%	1%	0%	99%	1%	0%
70–79	100%	0%	0%	100%	0%	0%
80–89	100%	0%	0%	100%	0%	0%
90+	100%	0%	0%	100%	0%	0%
Year: 2020 Age Group	Zero	Men One	Two	Zero	Women One	Two
<10	0%	1%	99%	0%	1%	99%
10–19	0%	4%	96%	0%	4%	96%
20–29	1%	13%	86%	1%	14%	85%
30–39	4%	22%	74%	4%	22%	74%
40–49	16%	38%	46%	16%	38%	46%
50–59	39%	42%	19%	38%	42%	20%
60–69	73%	25%	3%	73%	24%	3%
70–79	94%	6%	0%	94%	6%	0%
80–89	100%	0%	0%	100%	0%	0%
90+	100%	0%	0%	100%	0%	0%

(continued on the next page)

Table A1. Percentage of People in China with Different Counts of Living Parents, by 10-Year Age Group, Sex, and Year (continued)

Year: 2050 Age Group	Men			Women		
	Zero	One	Two	Zero	One	Two
<10	0%	1%	99%	0%	1%	99%
10–19	0%	3%	97%	0%	3%	97%
20–29	1%	10%	90%	1%	9%	90%
30–39	2%	21%	77%	2%	20%	78%
40–49	9%	34%	57%	9%	35%	57%
50–59	34%	45%	21%	35%	44%	21%
60–69	54%	37%	9%	54%	37%	10%
70–79	88%	11%	1%	88%	11%	1%
80–89	100%	0%	0%	100%	0%	0%
90+	100%	0%	0%	100%	0%	0%

Source: Authors' calculations.

Table A2. Percentage of People in China with Different Counts of Living Children, by 10-Year Age Group, Sex, and Year

Year: 1950 Age Group	Men			Women		
	Zero	One	Two or More	Zero	One	Two or More
<10	100%	0%	0%	100%	0%	0%
10–19	96%	2%	2%	87%	6%	6%
20–29	35%	24%	40%	27%	23%	50%
30–39	14%	13%	73%	6%	10%	83%
40–49	8%	11%	80%	3%	10%	87%
50–59	9%	14%	76%	4%	14%	82%
60–69	13%	20%	67%	7%	20%	73%
70–79	17%	23%	60%	11%	25%	64%
80–89	22%	31%	47%	16%	36%	48%
90+	100%	0%	0%	11%	56%	33%

(continued on the next page)

Table A2. Percentage of People in China with Different Counts of Living Children, by 10-Year Age Group, Sex, and Year (*continued*)

Year: 2020		Men		Women		
Age Group	Zero	One	Two or More	Zero	One	Two or More
<10	100%	0%	0%	100%	0%	0%
10–19	100%	0%	0%	100%	0%	0%
20–29	77%	18%	5%	47%	41%	12%
30–39	26%	46%	28%	9%	55%	36%
40–49	15%	46%	40%	7%	48%	45%
50–59	10%	37%	53%	4%	40%	56%
60–69	9%	32%	59%	7%	37%	56%
70–79	5%	15%	80%	5%	14%	80%
80–89	7%	11%	82%	3%	13%	85%
90+	6%	14%	80%	3%	15%	82%

Year: 2050		Men		Women		
Age Group	Zero	One	Two or More	Zero	One	Two or More
<10	100%	0%	0%	100%	0%	0%
10–19	100%	0%	0%	100%	0%	0%
20–29	80%	14%	5%	51%	36%	14%
30–39	31%	41%	28%	9%	51%	40%
40–49	23%	40%	37%	4%	50%	46%
50–59	16%	42%	42%	1%	53%	45%
60–69	18%	44%	38%	3%	55%	42%
70–79	14%	45%	41%	6%	50%	44%
80–89	12%	40%	48%	6%	44%	50%
90+	13%	36%	50%	15%	45%	40%

Source: Authors' calculations.

Table A3. Percentage of People in China with Different Counts of Living Siblings, by 10-Year Age Group, Sex, and Year

Year: 1950		Men		Women		
Age Group	Zero	One	Two or More	Zero	One	Two or More
<10	9%	37%	53%	10%	37%	53%
10–19	6%	47%	47%	6%	47%	47%
20–29	9%	48%	43%	9%	49%	42%
30–39	25%	51%	24%	25%	51%	25%
40–49	45%	43%	11%	44%	44%	12%
50–59	52%	40%	8%	52%	40%	8%
60–69	68%	29%	3%	67%	29%	4%
70–79	80%	18%	2%	81%	18%	1%
80–89	91%	9%	0%	95%	5%	0%
90+	100%	0%	0%	100%	0%	0%

Year: 2020		Men		Women		
Age Group	Zero	One	Two or More	Zero	One	Two or More
<10	47%	50%	2%	48%	50%	2%
10–19	43%	54%	3%	43%	54%	3%
20–29	35%	60%	5%	35%	61%	5%
30–39	14%	41%	45%	14%	41%	45%
40–49	12%	53%	36%	12%	53%	35%
50–59	5%	38%	58%	5%	38%	58%
60–69	8%	43%	49%	8%	43%	49%
70–79	15%	37%	48%	14%	38%	48%
80–89	38%	45%	17%	38%	44%	17%
90+	69%	25%	6%	66%	30%	4%

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Table A3. Percentage of People in China with Different Counts of Living Siblings, by 10-Year Age Group, Sex, and Year (*continued*)

Year: 2050 Age Group	Men			Women		
	Zero	One	Two or More	Zero	One	Two or More
<10	46%	50%	5%	46%	49%	4%
10–19	39%	56%	6%	39%	55%	6%
20–29	37%	57%	6%	37%	57%	6%
30–39	38%	58%	4%	38%	58%	4%
40–49	42%	55%	4%	42%	55%	4%
50–59	38%	58%	4%	38%	58%	4%
60–69	19%	40%	41%	19%	40%	42%
70–79	24%	50%	26%	24%	50%	26%
80–89	23%	39%	38%	23%	38%	38%
90+	45%	45%	10%	46%	44%	10%

Source: Authors' calculations.

Table A4. Percentage of People in China with Different Counts of Living Cousins, by 10-Year Age Group, Sex, and Year

Year: 1950 Age Group	Men			Women		
	Zero	1–9	10 or More	Zero	1–9	10 or More
<10	1%	28%	71%	1%	28%	71%
10–19	1%	38%	61%	1%	38%	61%
20–29	2%	45%	54%	2%	45%	54%
30–39	5%	57%	38%	5%	59%	36%
40–49	10%	65%	25%	10%	66%	24%
50–59	15%	71%	14%	15%	71%	14%
60–69	27%	67%	6%	25%	69%	6%
70–79	43%	56%	2%	42%	56%	1%
80–89	72%	28%	0%	52%	48%	0%
90+	67%	33%	0%	56%	44%	0%

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Table A4. Percentage of People in China with Different Counts of Living Cousins, by 10-Year Age Group, Sex, and Year (*continued*)

Year: 2020		Men		Women		
Age Group	Zero	1–9	10 or More	Zero	1–9	10 or More
<10	8%	47%	44%	9%	48%	44%
10–19	1%	37%	62%	1%	37%	62%
20–29	0%	25%	74%	0%	25%	75%
30–39	0%	8%	91%	0%	8%	92%
40–49	0%	9%	91%	0%	9%	91%
50–59	0%	7%	93%	0%	7%	93%
60–69	1%	16%	83%	1%	17%	83%
70–79	3%	28%	69%	3%	29%	69%
80–89	13%	60%	27%	14%	57%	29%
90+	30%	63%	7%	32%	60%	8%

Year: 2050		Men		Women		
Age Group	Zero	1–9	10 or More	Zero	1–9	10 or More
<10	15%	84%	1%	15%	84%	1%
10–19	9%	86%	5%	10%	85%	5%
20–29	6%	79%	15%	6%	80%	14%
30–39	3%	51%	46%	3%	51%	46%
40–49	1%	37%	63%	1%	36%	63%
50–59	0%	28%	72%	0%	27%	72%
60–69	0%	13%	87%	0%	12%	88%
70–79	0%	21%	78%	1%	21%	78%
80–89	2%	26%	72%	2%	26%	73%
90+	9%	51%	40%	8%	50%	42%

Source: Authors' calculations.

Table A5. Percentage of People in China with Different Counts of Living Aunts and Uncles, by 10-Year Age Group, Sex, and Year

Year: 1950	Men			Women		
Age Group	Zero	1–9	10 or More	Zero	1–9	10 or More
<10	4%	58%	38%	4%	59%	37%
10–19	12%	73%	15%	12%	73%	15%
20–29	21%	73%	6%	21%	73%	6%
30–39	32%	65%	2%	33%	65%	3%
40–49	51%	49%	1%	51%	49%	0%
50–59	71%	29%	0%	71%	29%	0%
60–69	87%	13%	0%	86%	14%	0%
70–79	95%	5%	0%	94%	6%	0%
80–89	100%	0%	0%	100%	0%	0%
90+	100%	0%	0%	100%	0%	0%

Year: 2020	Men			Women		
Age Group	Zero	1–9	10 or More	Zero	1–9	10 or More
<10	5%	49%	46%	5%	50%	46%
10–19	1%	36%	62%	1%	36%	63%
20–29	0%	30%	69%	0%	30%	70%
30–39	0%	23%	77%	0%	22%	77%
40–49	2%	33%	65%	2%	34%	64%
50–59	8%	43%	49%	7%	43%	50%
60–69	23%	59%	18%	23%	59%	17%
70–79	48%	51%	2%	49%	50%	1%
80–89	85%	15%	0%	85%	15%	0%
90+	95%	5%	0%	97%	3%	0%

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Table A5. Percentage of People in China with Different Counts of Living Aunts and Uncles, by 10-Year Age Group, Sex, and Year (continued)

Year: 2050	Men			Women		
Age Group	Zero	1–9	10 or More	Zero	1–9	10 or More
<10	15%	84%	1%	15%	84%	1%
10–19	16%	79%	5%	16%	79%	5%
20–29	12%	74%	14%	12%	75%	13%
30–39	5%	50%	44%	5%	51%	44%
40–49	2%	42%	56%	2%	42%	56%
50–59	4%	49%	47%	4%	49%	47%
60–69	8%	46%	46%	7%	46%	47%
70–79	28%	65%	7%	28%	65%	7%
80–89	54%	46%	0%	54%	46%	0%
90+	81%	19%	0%	80%	20%	0%

Source: Authors' calculations.

Table A6. Percentage of People in China with or Without a Living Spouse, by 10-Year Age Group, Sex, and Year

Year: 1950	Men		Women	
Age Group	No Living Spouse	Living Spouse	No Living Spouse	Living Spouse
<10	100%	0%	100%	0%
10–19	92%	8%	79%	21%
20–29	30%	70%	28%	72%
30–39	20%	80%	17%	83%
40–49	17%	83%	20%	80%
50–59	21%	79%	33%	67%
60–69	31%	69%	55%	45%
70–79	42%	58%	75%	25%
80–89	63%	37%	86%	14%
90+	100%	0%	100%	0%

(continued on the next page)

Table A6. Percentage of People in China with or Without a Living Spouse, by 10-Year Age Group, Sex, and Year (*continued*)

Year: 2020 Age Group	Men		Women	
	No Living Spouse	Living Spouse	No Living Spouse	Living Spouse
<10	100%	0%	100%	0%
10–19	98%	2%	90%	10%
20–29	50%	50%	37%	63%
30–39	26%	74%	25%	75%
40–49	16%	84%	18%	82%
50–59	12%	88%	23%	77%
60–69	15%	85%	33%	67%
70–79	26%	74%	59%	41%
80–89	41%	59%	82%	18%
90+	70%	30%	99%	1%

Year: 2050 Age Group	Men		Women	
	No Living Spouse	Living Spouse	No Living Spouse	Living Spouse
<10	100%	0%	100%	0%
10–19	99%	1%	89%	11%
20–29	69%	31%	53%	47%
30–39	45%	55%	32%	68%
40–49	33%	67%	23%	77%
50–59	22%	78%	17%	83%
60–69	19%	81%	16%	84%
70–79	21%	79%	25%	75%
80–89	32%	68%	53%	47%
90+	52%	48%	83%	17%

Source: Authors' calculations.

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About the Authors

Nicholas Eberstadt is the Henry Wendt Chair in Political Economy at the American Enterprise Institute.

Ashton Verdery is the Harry and Elissa Sichi Early Career Professor of Sociology, Demography, and Social Data Analytics at Pennsylvania State University.

Notes

1. Nicholas Eberstadt and Ashton Verdery are among the coauthors of *China's Changing Family Structure: Dimensions and Implications*, on which this report draws in part. See Nicholas Eberstadt, ed., *China's Changing Family Structure: Dimensions and Implications*, American Enterprise Institute, September 17, 2019, <https://www.aei.org/research-products/report/chinas-changing-family-structure-dimensions-and-implications>.

2. Alexandra Stevenson and Zixu Wang, "China's Population Falls, Herald a Demographic Crisis," *New York Times*, January 16, 2023, <https://www.nytimes.com/2023/01/16/business/china-birth-rate.html>.

3. For much more detail on the method behind this simulation, see Ashton Verdery, "Modeling the Future of China's Changing Family Structure to 2100," in *China's Changing Family Structure: Dimensions and Implications*, ed. Nicholas Eberstadt (Washington, DC: American Enterprise Institute, 2019), <https://www.aei.org/wp-content/uploads/2019/09/RPT-China%E2%80%99s-Changing-Family-Structure-online.pdf>. One point is worth noting here about our modeling: Our work largely relied on baseline demographic estimates and projections for China from the UN Population Division (UNPD) flagship publication, *World Population Prospects* (WPP). Our simulations worked off the 2019 revision of WPP, generating kinship networks and family structures that mimicked the population trends estimated and projected for China in that report. In mid-2022, UNPD released a 2022 revision for WPP. This latest assessment differs from the previous version mainly in assuming even lower fertility for China in the decades immediately ahead than had been proposed in the 2019 revision. The projected differences between WPP 2019 and WPP 2022 for China in 2050 are appreciable for the under-30 cohorts: Indeed, the 2022 revision anticipates roughly 27 percent fewer Chinese age 0–29 will be living in China in 2050 than the WPP revision predicts just three years earlier. This is to say, in light of the most recent "medium-variant" UNPD assumptions concerning China's demographic outlook, our modeled results in this report should be considered conservative (or perhaps optimistic) in the sense that the newest updates to the WPP would suggest an even more acute sibling and cousin famine for young Chinese and an even heavier prospective burden of parental and grandparental support in the coming decades than the one we describe.

4. Verdery, "Modeling the Future of China's Changing Family Structure to 2100."

5. These estimates come from Statista before 1950 and from the UN World Population Prospects 2019 after 1950. Aaron O'Neill, "Child Mortality Rate (Under Five Years Old) in China from 1850 to 2020," Statista, June 21, 2022, <https://www.statista.com/statistics/1041851/china-all-time-child-mortality-rate>; and UN Department of Economic and Social Affairs, Population Division, *World Population Prospects 2019: Highlights*, June 17, 2019, <https://www.un.org/development/desa/publications/world-population-prospects-2019-highlights.html>.

6. Gavin Jones, "The 'Flight from Marriage' in South-East and East Asia," *Journal of Comparative Family Studies* 36, no. 1 (Winter 2005): 93–119, <http://www.jstor.org/stable/41603982>.

7. Indicative of the more general lacuna here are the World Bank's classic 1993 and 2001 studies on rapid economic growth in East Asia. World Bank, *The East Asian Miracle: Economic Growth and Public Policy* (Oxford, UK: Oxford University Press, 1993); and Joseph E. Stiglitz and Shahid Yusuf, *Rethinking the East Asian Miracle* (Washington, DC: World Bank Publications, 2001). Neither volume contains the words "extended family" or "kinship networks," and in the 900-plus pages of text between the two reports, the word "kinship" appears only once.

One of the few economic studies over the past generation to mention the role of extended families in East Asian development is Dwight H. Perkins, "Law, Family Ties, and the East Asian Way of Business," in *Culture Matters: How Values Shape Human Progress*, ed. Lawrence E. Harrison and Samuel P. Huntington (New York: Basic Books, 2000), 223–43.

8. Some readers may expect a higher percentage of only children in China, given the four decades of birth planning in China. The discrepancy arises because each sibling is counted multiple times, by each of his or her siblings. In a population where two mothers have one child and two mothers have two, two-thirds of the children would have a sibling.

9. National Bureau of Statistics of China and East-West Center, *Fertility Estimates for Provinces of China, 1975–2000*, July 2007, <https://www.eastwestcenter.org/publications/fertility-estimates-provinces-china-1975-2000>.

10. National Bureau of Statistics of China and East-West Center, *Fertility Estimates for Provinces of China, 1975–2000*.

11. Our simulations are all-China population models. We do not attempt a simulation of family structure for urban or rural areas, due to the confounding effects of migration, which makes such a task immensely complex and ultimately unmanageable from a computational standpoint.

12. US Census Bureau, International Database, Population by Age, https://www.census.gov/data-tools/demo/idb/#/pop?COUNTRY_YEAR=2022&COUNTRY_YR_ANIM=2022&FIPS_SINGLE=CH&FIPS=CH&popPages=BYAGE&POP_YEARS=2020,2022,2060&menu=popViz&ageGroup=O.

13. Estimates for 2010 are in Wang Feng et al., "Economic Boom, Population Aging, and Policy Shift: What's Ahead for China?" (PowerPoint presentation, Ninth Meeting of the Working Group on Macroeconomic Aspects of Intergenerational Transfers, June 8, 2013), <https://www.ntaccounts.org/doc/repository/presentation%20Wang.pdf>.

14. Nicholas Eberstadt, "The Global War Against Baby Girls," *New Atlantis*, Fall 2011, <https://www.thenewatlantis.com/publications/the-global-war-against-baby-girls>.

15. In our models, the percentage of Chinese women age 50 and over with no spouse or children declines almost steadily from 2000 to 2100, but the opposite is true for older men. We expect the number of older men without spouses or children to exceed the totals for women in just a few years—and to continue climbing for another generation and more. Eventually, by our reckoning, this contingent may comprise 25 million older Chinese men, 4 percent of the country's entire male population.

16. For one thing, our simulation relies on the UNPD's medium-variant projections, the blue chip source in the field—but UNPD's current and future fertility projections could be overestimates since the exact magnitude of China's current birth undercount is unknown and future fertility forecasts are always uncertain. Other reputable demographers believe China's fertility levels might be considerably lower than the UNPD numbers we use. UNPD's medium-variant projections, which we use in our modeling, posit a total fertility rate in China of 1.69 for 2015–20 and of 1.75 for 2045–50—but the Wittgenstein Centre for Demography and Human Capital, also highly regarded, expects China's total fertility rate to fall over those same years (from 1.44 in 2015–20 to 1.41 in 2045–50). Wittgenstein Centre for Demography and Global Human Capital, Wittgenstein Centre Human Capital Data Explorer version 2.0, 2018, <http://dataexplorer.wittgensteincentre.org/wcde-v2>.

For another, our assumptions about marriage and divorce trends might prove conservative; China in 2050 could end up with many more never-married, separated, and divorced men and women of childbearing age than we assume, given today's trends in Japan, South Korea, Taiwan, and other spots in East Asia. In 2015, according to UNPD data, all but 2 percent of Chinese women and 6.5 percent of Chinese men in their late 30s were married (or had been at some point). By contrast, for Japan in 2015, over 22 percent of women and over 32 percent of men those same ages had never been married; for South Korea in 2015, the figures were 19.2 percent and 33 percent. For Hong Kong in 2016, 22 percent of women and 28.7 percent of men in their late 30s had never been married. And so on. UN Population Division, World Marriage Data 2019, 2019, <https://population.un.org/MarriageData/Index.html#/home>.

There is no reliable method for perfect forecasts of future fertility and marriage trends, for China or any other population. The point here is that considerably lower fertility trends than the ones we assumed for China are well within the realm of possibility—likewise, considerably lower future marriage rates and higher divorce rates. Under such alternative scenarios, extended kin networks would shrivel even more rapidly than in our projections, and the share of childless adult men and women would likewise be higher than in our calculations here.

17. Wittgenstein Centre for Demography and Global Human Capital, Wittgenstein Centre Human Capital Data Explorer version 2.0.

18. See World Bank, World Development Indicators, "Final Consumption Expenditure (% of GDP)," <https://databank.worldbank.org/reports.aspx?source=2&series=NE.CON.TOTL.ZS&country=CHN#>.

19. On the one hand, one can imagine that China's family structure challenges may induce a "shock" so large it reshapes economic relations, forcing people to turn toward nonfamilial ties and creating a virtuous cycle of expanding generalized trust and benefiting the economy. On the other hand, perhaps the frog will boil rather than leap out, as these changes unfold quickly in demographic time but slowly in the lives of individuals—shifting markedly over decades but never granting a specific year the distinction of being "when the crisis hit."

20. Ryuichi Kaneko, "Population Prospects of the Lowest Fertility with the Longest Life: The New Official Population Projections for Japan and Their Life Course Approaches," Joint Eurostat/UNECE Work Session on Demographic Projections,

October 2, 2007, Table 3, <https://www.unece.org/fileadmin/DAM/stats/documents/ece/ces/ge.11/2007/wp.12.e.pdf>.

21. Christophe Z. Guilmoto, “Sex Imbalances at Birth,” UN Population Fund, Asia and Pacific Regional Office, January 1, 2012, <https://www.unfpa.org/publications/sex-imbalances-birth>.

22. Ashton M. Verdery and Rachel Margolis, “Projections of White and Black Older Adults Without Living Kin in the United States, 2015 to 2060,” *Proceedings of the National Academy of Sciences* 114, no. 42 (October 2, 2017): 11109–14, <https://www.pnas.org/content/114/42/11109>.

