

THE GRAYING OF THE GREAT POWERS

DEMOGRAPHY AND GEOPOLITICS
IN THE 21ST CENTURY

BY
RICHARD JACKSON
NEIL HOWE

WITH
REBECCA STRAUSS
KEISUKE NAKASHIMA



ADVANCE PROOFS

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Center for Strategic and International Studies
1800 K Street, N.W.
Washington, D.C. 20006
Tel: (202) 887-0200
Fax: (202) 775-3199
Web: www.csis.org

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REPORT OVERVIEW

This report explores the geopolitical implications of “global aging”—the dramatic demographic transformation in population age structures and growth rates being brought about by falling fertility and rising longevity worldwide. Its viewpoint is that of the United States in particular and today’s developed countries in general. Its timeframe is roughly the next half-century, from today through 2050.

The report assesses how population aging and population decline in the developed world may affect the ability of the United States and its traditional allies to maintain national and global security. The analysis not only considers the impact of the demographic trends on population numbers, wealth, and defense capability, it also explores how they could change the temperament of society (by affecting risk tolerance, voter behavior, job mobility, religious extremism, and family structure)—and thus change national goals themselves. The report also looks closely at how demographic trends in the developing world will shape the future global security environment—and the threats and opportunities they pose for today’s graying great powers.

This overview summarizes the report’s main findings under two headings: findings about the demographic transformation and findings about its geopolitical implications. It also lays out the organization of the report and summarizes the ground covered in the different chapters.

Major Findings: The Demographic Transformation

- *The world is entering a demographic transformation of historic and unprecedented dimensions.*
- *The coming transformation is both certain and lasting; there is almost no chance that it will not happen—or that it will be reversed in our lifetime.*
- *The transformation will affect different groups of countries at different times. The regions of the world will become more unlike before they become more alike.*
- *In the countries of the developed world, the transformation will have sweeping strategic, economic, social, and political consequences that could hamper the ability of the United States and its allies to maintain security.*

- *In the countries of the developing world, the transformation will give rise to destabilizing economic, social, and cultural stresses that threaten to increase security risks over the next few decades.*

Major Findings: The Geopolitical Implications

- *The population and GDP of the developed world will steadily shrink as a share of the world's total. In tandem, the global influence of the developed world will likely decline.*
- *The population and GDP of the United States will steadily expand as a share of the developed world's total. In tandem, the influence of the United States in the developed world will likely rise.*
- *Most nations in sub-Saharan Africa and some nations in the Arab world and non-Arab Muslim Asia will possess large ongoing youth bulges that could render many of them chronically unstable until at least the 2030s.*
- *Many nations in North Africa, the Middle East, South and East Asia, and the former Soviet bloc—including China, Russia, Iran, and Pakistan—are now experiencing a rapid or extreme demographic transition that could push them toward civil collapse, or (in reaction) toward “neo-authoritarianism.”*
- *Ethnic and religious conflict will continue to be a growing security challenge both in the developing and developed world.*
- *Throughout the world, the 2020s will likely emerge as a decade of maximum geopolitical danger.*
- *The aging developed countries will face chronic shortages in young-adult manpower—posing challenges both for their economies and their security forces.*
- *An aging developed world may lose its reputation for innovation and boldness—and struggle to remain culturally attractive and politically relevant to younger societies.*

Organization of the Report

Chapter One, Population and Power surveys the recent explosion of worldwide interest in the influence of demography on geopolitics. We also take a step back and look briefly at what policymakers have concluded about this influence over the centuries—as well as what history itself suggests about the role of population. We explain why much of this “classical” thinking about political demography seems newly relevant to the prospects of the developed world in the twenty-first century. We discuss the social, political, and technological wildcards that may affect the

assumptions underlying our effort to project trends over nearly a half-century. Finally, we explain that our analysis does not point in any obvious ideological direction, but rather offers important lessons for foreign policy theorists of both the “realist” and “idealist” schools.

Chapter Two, The Developed World: Assessing the Projections analyzes the magnitude and timing of the aging trend in the developed world. We compare and contrast the demographic outlook in the United States and the other developed countries, discuss the underlying demographic drivers (fertility, mortality, and immigration), and examine the sensitivity of the projections to changes in the assumptions. We also project the impact of rising old-age dependency burdens on government budgets and of more slowly growing or declining working-age populations on employment and GDP growth.

Chapter Three, The Developed World: Assessing the Consequences examines the ways in which demographic aging will, directly or indirectly, affect either the ability or the willingness of the developed countries to maintain national and global security. We organize these demography-security linkages under three headings: (1) *Changes in Demographic Size*, or how the slowing trend in population size and (therefore) economic size directly constrains the national ability to project power; (2) *Changes in Economic Performance*, or how demographic aging indirectly affects the structure and productivity of the economy; and (3) *Changes in Social Mood*, or how demographic trends such as higher average age, smaller families, and growing ethnic and religious diversity are likely to affect the public’s outlook and priorities.

Chapter Four, The Developing World’s Demographic Future: Cause for Hope or Concern? looks at the diverse consequences of demographic change in the rest of the world. While a number of political scientists and security experts have offered a very optimistic interpretation of the consequences, we raise a series of cautions about what we dub the “demographic peace” thesis. We evaluate the threat of “youth bulge”-driven unrest in the youngest countries; the possibility of collapse or neo-authoritarian reaction in higher-income countries that are in the midst of the “demographic transition”; and the special challenges facing countries experiencing very rapid aging (like China) or extreme population decline (like Russia). We also discuss the likelihood and importance of worsening ethnic and religious conflict in the developing countries. The chapter concludes with a tour of the developing world by region.

Chapter Five, A Demographic Map of Our Geopolitical Future puts the analysis together into a single global perspective on the next century that includes both demographic and economic projections. We list our critical findings and discuss their geopolitical implications. We also present a framework for policy action that may bear consideration. The framework includes strategic responses on four broad fronts:

(1) *Demographic Policy*, or responses designed to slow demographic aging itself, including pronatalism and stepped-up (or better-managed) immigration; (2) *Economic Policy*, or responses designed to help the economy function better in the face of demographic aging, including initiatives that would lower old-age transfer burdens, raise national savings, and make labor markets more flexible; (3) *Diplomacy and Strategic Alliances*, or responses that help adapt diplomacy and strategic alliances to the new geopolitical threats and opportunities arising from global demographic change; and (4) *Defense Posture and Military Strategy*, or responses that help adapt force structures and capabilities to the new demographic realities.

The magnitude and timing of the coming demographic transformation are virtually locked in. The serious implications are becoming better known. It is imperative that policymakers begin to think about and implement critical strategic responses now, rather than wait for the predictable surprise to happen.

Chapter One

POPULATION AND POWER

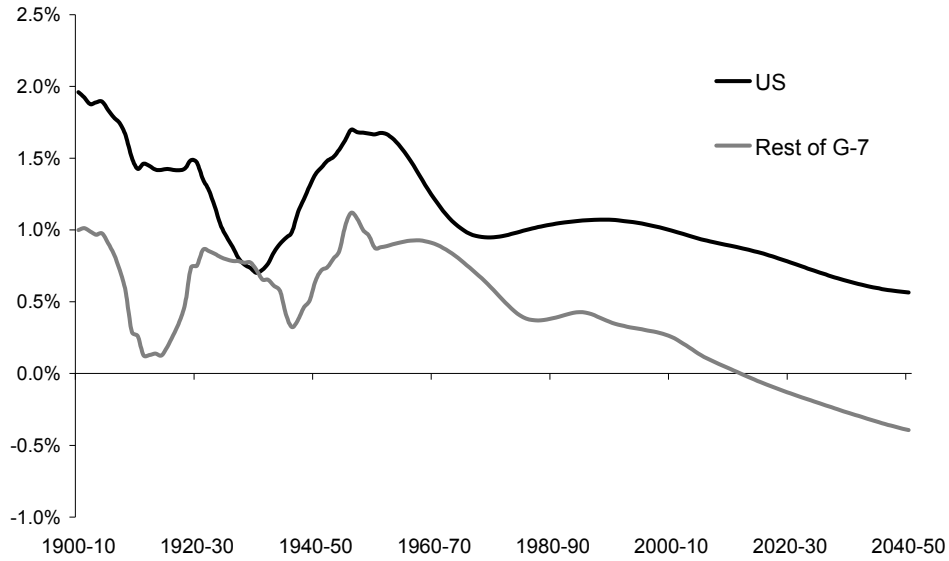
Today's developed countries stand on the threshold of a stunning demographic transformation. Throughout most of human history until well into the Industrial Revolution, the elderly only comprised a tiny fraction of the population—never more than 3 or 4 percent in any country. Today in the developed world, they comprise 16 percent. By 2030, the share is projected to rise to 23 percent and by 2050 to 26 percent.¹ In some of the fast-aging countries of Western Europe, it will reach 35 percent by 2050—and in Japan it will approach 40 percent. By mid-century, at least half of Americans will be over age 40 and at least half of Europeans will be over age 50.

Most developed countries will not only have aging populations, but stagnant or declining ones. By around 2015, working-age populations in almost every developed country will cease growing and in many cases begin to contract, the only major exception being the United States. By 2050, there will be 27 percent fewer working-age Germans than today and 39 percent fewer working-age Japanese. By the mid-2020s, total populations will also peak and plateau or begin to decline in almost every developed country—again, the only major exception being the United States. Japan and some of the fast-aging European countries are on track to lose nearly one-half of their total current populations by the end of the century. (See Figures 1-1 and 1-2, which compare the long-term population aging and population growth trends for the United States and the rest of the G-7 countries.)

Two forces are driving this demographic transformation. The first force is a long-term trend toward falling fertility. People are having fewer babies—and this both shrinks the relative number of younger people in the population and suppresses population growth. A generation ago, every developed country was at or above the 2.1 “replacement” fertility rate needed to maintain a stable population from one generation to the next. Today, every developed country is at or below it—

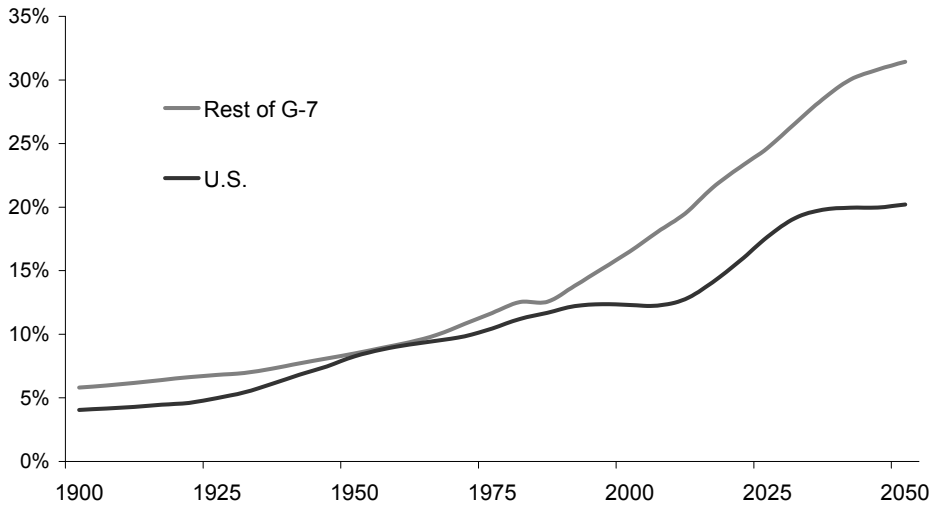
¹ Unless otherwise noted, the population projections in this report come from the UN Population Division's *World Population Prospects: The 2006 Revision* (New York: UN Population Division, 2007). The projections for the developed countries refer to the UN's “constant fertility” scenario. For the developing countries, we use either the UN's “high fertility” or constant fertility scenario, depending on each country's current location in the “demographic transition.” See Chapter 2 for a discussion of the developed-country projections and Chapter 4 for a discussion of the developing-country projections. Also see Appendix 1 for our classification of countries as developed or developing, which differs from the UN's, as well as definitions of the various regions referred to in this report.

Figure 1-1: Population Growth Rate of the United States and the Rest of the G-7 (10-Year Moving Average), 1900-2050



Source: *World Population Prospects* (UN, 2007); and Angus Maddison, *World Population, GDP and Per Capita GDP, 1-2003 AD*, August 2007, <http://www.ggdc.net/maddison/>.

Figure 1-2: Elderly (Aged 65 & Over), as a Share of the U.S. and Rest of G-7 Population, 1900-2050



Source: *World Population Prospects* (UN, 2007); Angus Maddison, *World Population, GDP and Per Capita GDP, 1-2003 AD*, August 2007, <http://www.ggdc.net/maddison/>; *Demographic Trends in the 20th Century* (Washington, DC: U.S. Census Bureau, November 2002); and *Population Statistics of Japan 2006* (Tokyo: National Institute of Population and Social Security Research, March 2006).

and many are far below it. In Japan, Germany, and Italy, the fertility rate is just 1.3. At the other extreme, the United States has been at or close to the replacement rate for the last 20 years and France recently announced that its fertility rate is now close to replacement as well.

The second force is a long-term trend toward rising life expectancy. People are living longer—and this enlarges the relative number of older people in the population. The rise in life expectancy over the postwar era has been stunning. Fifty years ago, life expectancy in the developed countries was in the mid- to late 60s. Today, it is in the late 70s—and in several countries, including Canada, Italy and Japan, it has passed age 80.

The transformation is not just affecting the world's affluent nations. Most, but not all, of the developing world is also progressing through what is known as the “demographic transition”—the shift from the high fertility and high mortality that characterizes traditional societies to the low fertility and low mortality that characterizes modern ones. Although populations in South Asia or Latin America remain considerably younger and faster-growing than populations in Europe or the United States, nearly all are showing the same strong trend toward an older average age and a decelerating growth rate. The demographic outlook in the developing world is shaping up to be one of extraordinary diversity. Many of the youngest, poorest, and least stable countries seem hardly touched by the transformation, while many of the most rapidly modernizing countries (especially in East Asia) are undergoing the entire population shift from young and growing to old and stable or declining at a breathtaking pace—far more rapidly than any of today's developed nations did.

This report investigates how the coming demographic transformation—or what is often called “global aging”—will reshape the geopolitical landscape through the first half of the twenty-first century. From the perspective of today's developed nations, the report addresses questions like the following:

- How will population change reshape the relative influence and power exercised by the world's nations and alliances?
- How will it change the performance of national economies, the mood of national electorates, and the effectiveness of national defense strategies?
- Will rising retirement and health costs crowd out spending on national defense and international affairs?
- Will today's developed countries come to depend on the surplus savings of rising developing nations to keep them afloat financially—and if so, how can we expect these new suppliers of capital to use their newly acquired leverage?
- Will armed forces experience chronic manpower shortages as the number of youth declines and tight civilian labor markets make military careers less attractive?

- Will the resources available to pursue geopolitical goals be further constrained by the changing temperament of risk-averse older voters?
- Will demographically declining societies be less willing to risk scarce young people in war, and will this accelerate the substitution of military technology for manpower?

Non-demographers may suppose that demographic projections so far into the future are highly speculative. But in fact the aging of the population in today's developed countries is perhaps the most certain prediction that social science can make about the future. Falling fertility and rising longevity are the result of many well-established trends (from rising living standards to the growing employment and educational achievement of women) that few experts believe will be reversed in the near future. And even if the experts are proved wrong, demographic momentum still ensures that the developed world will age dramatically in the decades to come. Even a new baby boom would have no appreciable impact on the size of the working-age population or the ratio of workers to retirees in the developed countries over the next 20 years and only a modest impact over the next 30 years.

The coming demographic transformation is thus virtually locked in. It is imperative that policymakers begin to think about its geopolitical implications now, rather than wait for the predictable surprise to happen.

This report will focus on the first half of the twenty-first century, ending in the year 2050. In most developed countries, the rise in the elderly share of the population will begin to accelerate around 2015, as large postwar baby boom generations cross the traditional threshold of old age. And, in most of them, the period of rapid aging will continue through at least the 2030s—and (especially in Europe) into the 2040s. To cut off our view earlier would be to terminate our projection before the age transition is complete. This would understate both the magnitude of the challenge and the leadership response that it requires. To look beyond 2050, on the other hand, might needlessly stretch the time horizon of our projection beyond the limits of prudence.

The report's policy focus is on the United States specifically and on the developed world generally. The purpose is to shed light on how the demographic transformation will affect the long-term security interests of the developed nations and how they can best prepare and respond. Our working assumption is that these nations share a cluster of basic priorities—such as liberal democracy and respect for human rights, property rights, due process, and national sovereignty—that will continue to endow them with powerful common interests over at least the next half-century. The United States may also learn from the experience of other developed countries, most of which are aging more rapidly.

Although the developed world has the spotlight, the rest of the world will not be neglected. The report pays considerable attention to the developing countries. These are the players who will shape the threats and opportunities with which our protagonists must contend. From “youth bulges” in the Muslim world to a population implosion in Russia to “premature aging” in China, striking demographic trends the world over will reshape the future environment for U.S. policy.

Traditionally, and even as recently as the Cold War, the link between demography and national security has been viewed as the brute means by which a country's population can help achieve the goals of a nation's leadership—what RAND scholar Brian Nichiporuk calls “the bucket of capabilities” perspective.² In the extreme, this can reduce the significance of population to a few basic numbers such as GDP or service-age adults. While the simple capabilities perspective is important, this report will take advantage of new scholarship in the social sciences and look more broadly at how demographic change can not only change capabilities in both a direct and indirect fashion (by altering savings rates or productivity growth, for example), but also change national goals themselves. By affecting risk tolerance, voter behavior, job mobility, religious extremism, and family structure, demography can in fact transform the very temperament of a society. In short, we will have as much to say about national aspirations as about national power.

The demographer Nicholas Eberstadt has warned that demographic change may be “even more menacing to the security prospects of the Western alliance than was the Cold War for the past generation.”³ While it would be fair to point out that such change usually poses opportunities as well as dangers, his basic point is incontestable: Planning national strategy for the next several decades with no regard for population projections is like setting sail without a map or a compass. It is likely to be an ill-fated voyage. In this sense, demography is the geopolitical cartography of the twenty-first century.

In the rest of this chapter, we begin by surveying the recent explosion of worldwide interest in the impact of demography on geopolitics. We note that, despite the new interest, there has been no single comprehensive account of how this dynamic is likely to shape our long-term future. We wrote this report expressly to help fill this void in the national security literature. Next, we step back and briefly survey what policymakers have been thinking and writing about population and power since the dawn of civilization. We also offer some tentative lessons that history itself provides about the connection between population and power. Finally, we identify and explain the critical assumptions that will guide our analysis in the rest of the report. We conclude with a discussion of how our findings are or are not aligned with the two main schools of thinking about geopolitical affairs—the realist and the idealist.

POPULATION AND POWER: THE NEW GLOBAL INTEREST

Fortunately, both academics and the general public have recently begun to pay a lot more attention to the consequences of demographic change. The worldwide interest in this topic is indeed greater today than at any time since the Great Depression and World War II—which means this report may be appearing at an opportune moment.

² Brian Nichiporuk, *The Security Dynamics of Demographic Factors* (Santa Monica, CA: RAND Corporation, 2000), 5.

³ Nicholas Eberstadt, “Population Change and National Security,” *Foreign Affairs* 70, no. 3 (Summer 1991), 129.

Ten years ago, global aging was hardly on the radar screen of most U.S. policymakers. Today, it dominates almost any discussion of America's long-term fiscal, economic, or foreign-policy direction. "Until about the year 2000," writes Walter Laqueur, "most thinking about the future of Europe, political, social, economic, or cultural, ignored demography."⁴ Now that has changed as well. Global demographic trends are monitored and studied at the highest leadership levels—at G-7 economic conferences, at NATO summits, and in the U.S. Defense Department strategy documents. Leaders and legislators debate the domestic impact of demographic aging on everything from unemployment and infrastructure to pensions and health-care spending. Global policymakers are learning to use a whole new vocabulary: birth wars, pronatalism, demographic engineering, ethnic competition, diaspora networks, youth bulges, youth deficits, population implosion, aging recessions, and budgetary graying.

Meanwhile, as ordinary citizens learn more about demographic aging, they too are taking greater interest—often by expressing concern over the future of their country, their people, their language, their ethnicity, or simply their way of life. Questions that were never asked when the prevailing worry was overpopulation—will "we" prevail in the long run? or even survive?—acquire new saliency. As Michael Teitelbaum and Jay Winter put it in *The Fear of Population Decline*, their prescient 1985 book examining the first signs of disquiet over falling fertility in Europe, such worries have "almost always conjured up a multitude of alarming images. Many of them have revealed fears not only about numbers but also about the quality, vitality, or optimistic outlook of a nation's inhabitants."⁵

When expert opinion pushes in the same direction as popular worries, the result is often political action—for example, to enact pronatal incentives. Over the last decade, many major governments have enacted or have begun to consider social policy reforms that would give women an additional inducement to have more children—including Germany, France, the UK, Italy, Spain, Poland, Russia, Japan, Australia, and South Korea. Vladimír Špidla, the European Union's (EU) commissioner for employment and social affairs, has recently asked that all new EU policies be evaluated for their effect on birthrates and family formation.⁶ Whether any of these measures are likely to result in significantly higher fertility is (as we shall see) debatable.

Throughout the developed world, where the concern over demographic change is strongest, public opinion has been galvanized by memorable media episodes in each country. Early in 2004, the cover of *Der Spiegel* showed a baby hoisting 16 old Germans on a barbell with the caption: "The Last German—On the Way to an Old People's Republic."⁷ The Japanese government, while passing one of its many

⁴ Walter Laqueur, *The Last Days of Europe: Epitaph for an Old Continent* (New York: Thomas Dunne Books, 2007), 33.

⁵ Michael S. Teitelbaum and Jay M. Winter, *The Fear of Population Decline* (London: Academic Press, 1985), 2.

⁶ Elisabeth Rosenthal, "European Union's Plunging Birthrates Spread Eastward," *The New York Times*, September 4, 2006.

⁷ Quoted in Ben J. Wattenberg, *Fewer: How the New Demography of Depopulation Will Shape Our Future* (Chicago: Ivan R. Dee, 2004), 103.

fertility initiatives (including a “Fundamental Law Against a Decline in the Fertility Rate”), stirred public controversy by the release of a projection showing the date at which Japan’s population would eventually decline to zero.⁸ In France, Prime Minister Jean-Pierre Raffarin faced down unions dominated by older workers by announcing that reform of the nation’s unsustainable pension plan was “necessary for the survival of the republic.”⁹ In Italy, Pope John Paul II characterized “the crisis of births” as a “serious threat” in a nation described by *La Stampa* as “the oldest country in the world, a country of great-grandparents.”¹⁰ Venice recently announced that it is losing younger residents so fast (its population has already fallen by half over the last 40 years) that the city will soon need to repackage itself as an empty “Disneyland” for foreign visitors.¹¹

In nearly all of the developed countries, local authorities in rural regions worry about the decline in the number of young native residents, while in urban areas they worry about the growth in the number of young immigrant residents. TV and magazine features about rural towns often focus on the closure of schools and infrastructure, along with the emigration of youth. Features about urban centers often focus on the difficulties of assimilating foreigners.

When news about aging and fertility decline is covered in the media, the tone is overwhelmingly one of worry—with negative interpretations outnumbering positive interpretations (according to one count) by 13-to-1.¹² Highest on the list of negative consequences are damage to the economy and loss of national power and influence. The environmental impact, while usually billed as positive, is mentioned much less often. Not surprisingly, the journalistic alarm appears least frequently in developed countries with relatively high fertility rates (for example, the United States) and most frequently in countries with relatively low fertility rates (for example, Japan or Spain).

Over the last few years, many writers and pop-culture creators in the developed world have taken the public’s demographic worries and have leveraged them into a message of pessimistic declinism. “Why is Europe committing demographic suicide, systematically depopulating itself?” asks George Weigel in *The Cube and the Cathedral*.¹³ “Japan offers the chance to observe the demographic death spiral in its purest,” notes Mark Steyn in *America Alone*.¹⁴ In some cases, the book titles say it all: *France Is Falling* (Nicolas Baverez), *Can Germany Be Saved?*

⁸ *Population Statistics of Japan 2003* (Tokyo: National Institute of Population and Social Security Research, March 2003).

⁹ Mark Lander, “West Europe is Hard Hit by Strikes over Pensions,” *The New York Times*, June 4, 2003.

¹⁰ Elizabeth L. Krause, “The Dangerous Demographics: The Scientific Manufacture of Fear,” Briefing no. 36 (Dorset: The Corner House, July 2006), 1.

¹¹ John Hooper, “Population Decline Set to Turn Venice into Italy’s Disneyland,” *Guardian* August 26, 2006.

¹² Laura Stark and Hans-Peter Kohler, “The Debate over Low Fertility in the Popular Press: A Cross-National Comparison, 1998-1999,” *Population Research and Policy Review* 21, no. 6 (December 2002).

¹³ George Weigel, *The Cube and the Cathedral: Europe, America, and Politics Without God* (New York: Basic Books, 2005), 21.

¹⁴ Mark Steyn, *America Alone: The End of the World as We Know It* (Washington, DC: Regnery Publishing, 2006), 24.

(Hans-Werner Sinn), *The Last Days of Europe* (Walter Laqueur).¹⁵ Notable dystopian visions of an aging and childless social future include the British film hit, *Children of Men*, the documentary *Demographic Winter: The Decline of the Human Family*, and the best-selling book *Minimum*, by novelist Frank Schirrmacher.¹⁶

In the developing world, demographic projections are triggering a greater variety of responses. In regions hit hard by falling fertility and imminent population decline, some leaders are expressing desperate urgency about turning these trends around. President Vladimir Putin, citing his nation's future economic and security needs, has flatly declared Russia's birth dearth to be "the most acute problem facing our country today."¹⁷ To raise the birthrate, the state is trying to motivate parents through monetary incentives, patriotic clubs, and emotional propaganda. Many nations in Eastern Europe—and now even East Asian nations like South Korea and Singapore (whose fertility rates have recently plunged to among the world's lowest)—likewise feel a sense of demographic vulnerability and have enacted or are considering policy changes. In Singapore the family planning slogan used to be "Two is enough." Now it is "Three Children or More if You Can Afford It."¹⁸

In higher-fertility regions, national responses can be very different. Many governments are still working to overcome traditional pronatal customs in order to reduce population growth and thereby alleviate poverty and spur development. Others take a relatively neutral posture. And in several notable recent instances, leaders have championed faster demographic growth. Incoming President Berdymukhamedov of Turkmenistan is this year instituting lavish new benefits for large families.¹⁹ President Mahmoud Ahmadinejad of Iran would like to reverse his nation's recent fertility decline and claims that Iran has the "capacity" to handle 50 million more citizens.²⁰ President Recep Tayyip Erdoğan of Turkey has often advocated "more babies" in the name of Islam and decried contraception as "straight out treason to the state"—provocative remarks given Turkey's pending EU membership (and the expectation that it will in any case surpass Germany in population by 2015).²¹

Meanwhile, many radical Islamist leaders advocate higher fertility as a means by which Muslim-majority nations can, over time, wrest greater control of global affairs. They variously describe most forms of family planning as pro-Western, contrary to Shari'a, and a hindrance to jihad. Their rhetoric is strident. "We're the ones who will change you," declared Norwegian imam Mullah Krekar to the Oslo

¹⁵ Nicolas Baverez, *La France qui tombe* (Paris: Perrin, 2003); Hans-Werner Sinn, *Ist Deutschland noch zu retten?* (Berlin: Econ, 2003); and Laquer, *op. cit.*

¹⁶ *Children of Men*, DVD, directed by Alfonso Cuarón (2006); *Demographic Winter: The Decline of the Human Family*, DVD, directed by Rick Stout (2008); and Frank Schirrmacher, *Minimum: Vom Vergeben und Neuentscheiden unserer Gemeinschaft* (Munich: Blessing, 2006).

¹⁷ "Vladimir Putin on Raising Russia's Birth Rate," *Population and Development Review* 32, no. 2 (June 2006).

¹⁸ Slogans quoted in Helen Ginn Daugherty and Kenneth C. W. Kammeyer, *An Introduction to Population*, 2nd ed. (New York: Guilford Press, 1995), 255.

¹⁹ "Turkmenistan's Plan for Baby Boom," BBC News, March 5, 2008.

²⁰ "Iranians Urged to Have More Kids," Reuters, October 22, 2006.

²¹ "Contraception is Treason, Turkish Islamist Leader Says," Agence France Presse, February 16, 2002.

media in 2006.²² “Just look at the development within Europe, where the number of Muslims is expanding like mosquitoes... Our way of thinking...will prove more powerful than yours.” Likewise, Mullah Yusuf al-Qaradawi in London in 2004: “Israelis might have nuclear bombs but we have the children bomb and these human bombs must continue until liberation.”²³ Although national Islamist parties holding this aggressively pronatalist posture have yet to win political power in a Muslim-majority nation (and were decisively defeated in the Pakistani election of 2008), their world view has a significant constituency.

For most people living in the developing world, however, demographic fears do not play out at the global or national level with anywhere near the intensity that they do at the subnational level—that is, the level of tribal, racial, and ethnic competition. Due to the strength of many historic animosities, the weakness of many national governments, and the absence of superpower intervention (after the close of the Cold War), what Milica Bookman calls an “inter-ethnic war of numbers” is now unfolding inside a remarkable number—probably a majority—of developing countries in the Eastern Hemisphere.²⁴ We mention here merely the conflicts that have recently been in the headlines: in Lebanon (between three religious groups), in India (two religious groups), in Pakistan (two religious groups), in the former Yugoslavia (six nationalities, at least twelve ethnic minorities, and three religious groups), in Iraq (two religious groups), in Malaysia (two ethnic groups), or in the former Soviet Commonwealth of Independent States (CIS) or the states of sub-Saharan Africa (where the ethnic, religious, and language divisions are beyond counting). Rising disparities between the growth rates of different groups, with some groups shrinking while others are still doubling every two decades, further intensifies the perception of competition. The number of non-exiled refugees (or “internally displaced persons”) driven from their homes by such struggles reached an unprecedented 42 million worldwide in 2002.²⁵

Whether these conflicts are waged with armed militias or at the ballot box, they are often regarded by participants as explicit struggles for domination in which numbers play a critical role and population growth wins the long-term prize. They too constitute a demographic dynamic (which we discuss in Chapter 4 of this report) that will help shape the geopolitics of the next half-century, even if they do mostly unfold beneath the level of international relations.

Somewhat surprisingly, given the recent explosion of attention to population and power in so many countries, there has been no serious and comprehensive treatment of how demographic trends will shape the world’s long-term geopolitical future. This report, accordingly, fills a void in the national security literature.

To be sure, there has been much new writing about most other aspects of global aging. The single issue that has received perhaps the most attention, both in

²² “Krekar Claims Islam Will Win,” *Aftenposten*, March 13, 2006.

²³ Nick Fiedling and Dipesh Gadher, “London-based Radical Salutes Bombs ‘Victory,’” *The London Times*, July 17, 2005.

²⁴ Milica Zarkovic Bookman, *The Demographic Struggle for Power: The Political Economy of Demographic Engineering in the Modern World* (London: Frank Cass, 1997), 1.

²⁵ *Global Humanitarian Emergencies: Trends and Projections, 2001-2002* (Washington, DC: The National Intelligence Council, September 2001).

the popular press and academic journals, has been the impact of demographic change on future economic performance—and, in particular, on rates of savings and investment worldwide and on the sustainability of public and private retirement systems. This has become the subject of many long research institute monographs (for example, from the Brookings Institution, the World Bank, and the IMF), several popular books (by Peter G. Peterson and by Larry Kotlikoff and Scott Burns, among others), hundreds of academic articles, and a flood of journalism.²⁶ Other topics receiving broad coverage include the connections between global aging and size of government, workforce productivity, and international migration.

There is also a growing scholarly literature on specific demographic topics with a direct connection to geopolitics. The empirical and analytical research on “youth bulges” and their correlation with outbreaks of civil disorder and regional conflict, for example, is impressive. Other topics with potential security implications that are attracting special scholarly interest include changes in family structure in high-income societies, the implications of immigration into the developed countries, the impact of population-related environmental damage on inter-state conflict, the widening gender imbalance in several East and South Asian societies, and differential growth between ethnic minorities. Casting a wider net, one could include many other topics covered in academic and professional journals having a more indirect connection to geopolitics, such as the impact of global aging on health, human resources, marketing, the media, and urban planning.

This literature, however, is narrowly focused and the gaps between the topics it covers are wide. To date, U.S. federal agencies and their contractors, including the CIA, the National Intelligence Council (NIC), and the RAND Corporation, have issued the only book-length policy monographs focusing mostly on demography and geopolitics.²⁷ These are very useful, yet also very introductory. Several eminent scholars, most notably Paul Kennedy and Samuel Huntington, have written geopolitical treatises that touch on demographic trends, but only indirectly.²⁸ Ben Wattenberg and Phillip Longman have published book-length interpretations of global aging, but these only indirectly touch on geopolitics.²⁹

²⁶ Among the more notable books are Peter S. Heller, *Who Will Pay? Coping with Aging Societies, Climate Change, and Other Long-Term Fiscal Challenges* (Washington, DC: International Monetary Fund, 2003); The World Bank, *Averting the Old Age Crisis: Policies to Protect the Old and Promote Growth* (New York: Oxford University Press, 1994); Barry Bosworth and Gary Burtless, *Aging Societies: The Global Dimension* (Washington, DC: Brookings Institution Press, 1998); Peter G. Peterson, *Gray Dawn: How the Coming Age Wave Will Transform America—and the World* (New York: Times Books, 1999); and Larry J. Kotlikoff and Scott Burns, *The Coming Generational Storm: What You Need to Know about America's Economic Future* (Cambridge, MA: MIT Press, 2005).

²⁷ *Mapping the Global Future* (Washington, DC: The National Intelligence Council, December 2004); *Long-Term Global Demographic Trends: Reshaping the Geopolitical Landscape* (Washington, DC: U.S. Central Intelligence Agency, July 2001); Nichiporuk, 2000, *op. cit.*; and Brian Nichiporuk, *Alternative Futures and Army Force Planning: Implications for the Future Force Era* (Santa Monica, CA: RAND Corporation, 2005).

²⁸ Paul M. Kennedy, *The Rise and Fall of the Great Powers: Economic Change and Military Conflict from 1500 to 2000* (New York: Vintage, 1989); and Samuel P. Huntington, *The Clash of Civilizations and the Remaking of World Order* (New York: Simon & Schuster, 1996).

²⁹ Ben J. Wattenberg, *op. cit.*; Phillip Longman, *The Empty Cradle: How Falling Birthrates Threaten World Prosperity and What to Do About It* (New York: Basic Books, 2004).

One recent and fascinating book genre—the authors include Patrick Buchanan, Mark Steyn, George Weigel, Herb Meyer, Walter Laqueur, Nicolas Baverez, and Hans-Werner Sinn—draws a direct connection between demographic aging and civilizational decline.³⁰ Although this thesis has obvious geopolitical implications, the works themselves are far too polemical and too casually researched to be regarded as more than provocative commentary.

Yet by calling attention to the intensity of the discussion now surrounding demographic change, these works do usefully point toward some obvious questions: Why is demography suddenly the object of so much attention? Has this happened before? What have eminent statesmen and thinkers said about how demography shapes geopolitics? What lessons in fact arise from the historical track record?

POPULATION AND POWER: LESSONS OF HISTORY

Demographic change shapes political power like water shapes rock. Up close the force looks trivial, but viewed from a distance of decades or centuries it moves mountains. To illustrate how dramatically populations can displace each other over time, the historian E.M. Kulischer once reminded his readers that in A.D. 900 Berlin had no Germans, Moscow had no Russians, Budapest had no Hungarians, Madrid was a Moorish settlement, and Constantinople had hardly any Turks. He added that the Normans had not yet settled in Great Britain and before the sixteenth century there were no Europeans living in North or South America, Australia, New Zealand, or South Africa.³¹ As Mark Steyn pithily remarks, “Demographics is a game of last man standing.”³²

Before this report embarks on an effort to analyze how demographic change will shape the geopolitics of the twenty-first century, it seems appropriate to take a look back over previous centuries and to see if any broad themes can be distilled from the many twists and turns of historical experience. That population change contributes to the rise and fall of nations and empires is a fact of great antiquity. That policy leaders and their advisers often ponder its contribution, and strive to influence it, is also a fact of great antiquity. We approach these facts in reverse order. We look first at what societies have thought and said about population and power, and then look at what (if anything) the past actually teaches us about their connection.

To answer our first question, let’s start with the obvious—that, from the beginning of history and almost continuously until the modern era, most societies (or at least their elites) have been seriously concerned about population. And their main worry, with few exceptions, has been how to maintain sufficient population

³⁰ Patrick J. Buchanan, *The Death of the West: How Dying Populations and Immigrant Invasions Imperil Our Country and Civilization* (New York: St. Martin’s Press, 2002); Mark Steyn, *op. cit.*; Weigel, *op. cit.*; Herbert E. Meyer, “An Open Letter to Europe,” *The American Thinker*, November 11, 2004; Laqueur, *op. cit.*; Baverez, *op. cit.*; and Sinn, *op. cit.*

³¹ Eugene M. Kulischer, *Europe on the Move: War and Population Changes, 1917-47* (New York: Columbia University Press, 1948).

³² Steyn, *op. cit.*, 3.

growth. They have sought growth at a minimum in order to withstand the ravages of war, disease, starvation, and other unforeseeable catastrophes, and at a maximum to be able to expand by conquering, absorbing, or displacing neighbors.

By most accounts, this powerful “populationist” attitude (disposed to preventing deaths, promoting births, and favoring the assimilation of others through immigration or emigration) has its origin in the prehistoric nature of humankind. Anthropologists and sociobiologists have observed that humans are a species whose members favor their own offspring and who organize into coalitions (initially families, clans, and tribes) to further that goal. These coalitions in turn foster cultural values and social rules that preserve their own groups’ integrity and encourage their own groups’ safety, prosperity—and multiplication. Coalitions that succeed in this agenda may survive, though perhaps just barely. Coalitions that do not, perish. The claim that prehistoric societies valued group solidarity and group welfare is hardly controversial. To support the further claim that they vigorously promoted fertility, scholars point to abundant evidence: family formation strategies that maximized births and equated family size with social status (usually through polygamy), the celebration of fertility and the honoring of mothers, and widespread ancestor worship (which pressures believers to procreate in order that they achieve immortality through the worship of their descendants).³³

Not surprisingly, most of the later historical religions—at least those that endured to play a major role in history—continued to encourage or even mandate many children and large families. This is true of all of the major monotheisms (Judaism, Christianity, Islam, and Zoroastrianism) as well as Confucianism. In his classic history of population doctrines, Charles Stangeland explains: “Injunctions similar to Jehovah’s command, ‘Increase and multiply,’ are found in the religions of practically every ancient nation. For this almost universal attitude toward population an explanation must be found in the fact that the early nations were in a state of almost continuous hostility; always menaced and menacing.”³⁴

When the early leaders of political states began to design or enact explicit demographic policies, they did not need to invent new directives so much as co-opt directives that were already entrenched in the prevailing culture. The early rulers of Sumer and Babylonia gave fertility cults official status and installed them on the ziggurats. The great lawgivers Hammurabi, Lycurgus, and Solon codified family norms in a manner which (in the opinion of some scholars) favored higher birthrates. Ancient writers frequently relate, through anecdote, the brutal pronatalism of ancient leaders. In his famous oration, Thucydides has Pericles tell Athenian women that the best way they can help in wartime is to bear more children. According to Plutarch, Philip of Macedon passed a law forcing his subjects to marry early to fill the future ranks of his army; his son Alexander likewise ordered thousands of his conquering soldiers to marry Persians. (At nearly the same

³³ For a primer on the sociobiology of the populationist impulse, see Walter Scheidel, “Sex and Empire: A Darwinian Perspective,” Princeton/Stanford Working Papers in Classics no. 050603 (Princeton, NJ: Princeton University, May 2006); see also Charles E. Stangeland, *Pre-Malthusian Doctrines of Population: A Study in the History of Economic Theory* (New York: Sentry Press, 1904); and Johannes Overbeek, *History of Population Theories* (Rotterdam: Rotterdam University Press, 1974).

³⁴ Stangeland, *op. cit.*, 40.

time, the Confucian forerunner Mo Zi was arguing in China that all men should be compelled to marry at 20, all women at 15.) Plutarch also tells the story of another Macedonian, Pyrrhus of Epirus, whose “Pyrrhic victories” on behalf of the Italian Greeks against the Roman Republic were to no avail. Due to Rome’s prodigious birthrate, its losses could be effortlessly replaced after every battle.

“Presumably,” writes demographer Johannes Overbeek of ancient civilizations, “fertility was always or almost always praised and policies were aimed at the maintenance of high birthrates.”³⁵ Paul Demeny agrees: “Measures encouraging marriage and sometimes immigration testify to the prevailing populationist sentiment among rulers throughout history.”³⁶ At no time did ancient writers express this populationism with such vehemence as when their policies were failing and their numbers were falling. Observing the demographic decline of Greece in the third century B.C., Polybius specifically noted the absence “of continuous wars or epidemics” and blamed it instead on “the ostentation, avarice, and laziness” of citizens who were “unwilling to marry or, if they did marry, to bring up the children born to them; the majority were only willing to bring up at most one or two.”³⁷ In the late Roman Republic, Cicero and other statesmen inveighed against the low birthrate of the Roman elite. During the empire, Tacitus routinely compared the large families of the Germans with the small families of Romans as a sign of his countrymen’s loss of civic and personal virtue.

During the Middle Ages, as Christian Europe devolved into feudalism, rulers seldom worried about births except within their own families; attention to demography as a policy issue practically vanished. The most interesting writers on population and power were Muslim and Chinese (for example, Ibn Khaldun and Ma Duanlin) who lived in regions where empires still thrived.

Intellectual currents again shifted back toward Europe with the Renaissance and Reformation—and especially with the rise of the modern Western nation state. As they rediscovered classical texts, humanists like Machiavelli began reviving the image of the powerful state, whose strength rested on both the number and quality of its citizens. As they overhauled religion, reformers like Martin Luther attacked the Catholic Church for encouraging celibacy and monasticism, and allied the early Protestants behind universal marriage and many children. Channeling these impulses into a full-fledged populationist doctrine were the state-building monarchs, who sought out every tool at their disposal to build up trade, increase tax revenue, arm troops, suppress feudal rebels, acquire new territories, hold gaudy courts, sponsor great works of art, and in general celebrate their own autocratic magnificence. Key among those tools (or so these rulers and their advisers thought) should be policies that would increase their nation’s population.

The era lasting from roughly 1450 to 1750 in Europe thus showcased an unparalleled obsession about the connection between demography and geopolitics. And most of it consisted of a one-sided advocacy of populationism—a virtuous

³⁵ Overbeek, *op. cit.*, 1.

³⁶ Paul Demeny, “Population Policy: A Concise Summary,” Policy Research Division Working Papers no. 173 (New York: Population Council, 2003), 3.

³⁷ Quoted in Arnold J. Toynbee, *Greek Civilization and Character: The Self-Revelation of Ancient Greek Society* (New York: E.P. Dutton & Co., 1924), 99.

circle of higher birthrates, more employment, more income, more taxes, more public works, attractive opportunities for immigrants, and exploitative opportunities for emigrants. Henry IV of France thought that “the strength and riches of kings consist in the number and opulence of their subjects,” while Frederick the Great of Prussia considered it axiomatic that “the number of people makes the wealth of states.” “In the multitude of people is the king’s glory,” observed Jacques Bénigne Bossuet, the renowned French orator and political theorist. Bernard Mandeville, the English philosopher and political economist, called a growing population “the never-failing Nursery of Fleets and Armies.”³⁸ As late as the 1750s, Denis Diderot contributed an entry called “Puissance” for the *Encyclopédie* in which he explained that a nation’s strength lies in its numbers.

The next turning point came in the late eighteenth century. Enjoying higher living standards and steeply declining mortality rates (especially among children—which was equivalent to a boost in the birthrate), the population of Western Europe began growing at an accelerating rate. The demographic transition was underway. At the same time, many royal advisers and pamphleteers began shifting the focus of their writing by pointing out some of the costs of rapid population growth, from the crowded cities and teeming migrants to high rates of unemployment and large numbers of abandoned children. Then, in 1798, an erudite English parson named Thomas Malthus published *An Essay on the Principle of Population*, an instant sensation across the salons of Europe (its sixth and last edition appeared in 1826), which offered a radical reappraisal of the effect of population growth on social welfare and state power.³⁹ A growing population does not make us better off, Malthus argued. By overwhelming the availability of natural resources (especially land), a growing population must ultimately impoverish society and make us worse off. Standard populationist measures such as bounties for extra children aren’t merely ineffective; they are counterproductive.

It would be difficult to overestimate the influence Malthus has exercised over the subsequent two centuries. As population growth sped up and the Industrial Revolution took off during the “hungry ‘40s,” the European aristocracy and bourgeois electorates regularly invoked Malthus to justify their new doctrine of market liberalism and their disinterest in social welfare programs. Toward the end of the century, imperialists across Europe regularly invoked him to justify their colony-building projects. From the French Revolution to World War I and beyond, most economic and social policy theorists (especially in England) paid homage to his doctrine—from David Ricardo, Frédéric Bastiat, Jean-Baptiste Say, and John Stuart Mill to Herbert Spencer, Alfred Marshall, Henry George, and Sidney and Beatrice Webb. In his famous book on the prospects of Europe in 1919, John Maynard Keynes worried that overpopulation had spawned the twin evils of militarism and bolshevism. “Malthus disclosed a devil,” he wrote. “For half a

³⁸ Henry IV, in M. Berger de Xivrey, *Recueil des lettres missives de Henri IV*, 9 vol. (1843–76; finished by J. Guadet); Frederick the Great, in *Oeuvres de Frédéric le Grand* (31 vols., 1846–57), IV, 4; Bénigne Bossuet, “Politique tirée des propres paroles de l’Écriture Sainte,” *Oeuvres de Bossuet* (Paris: Firmin Didot Frères, 1841), I, 457; and Bernard Mandeville, *Fable of the Bees: or, Private Vices, Publick Benefits* (London, 1714).

³⁹ Thomas Malthus, *An Essay on the Principle of Population* (1798).

century all serious economical writings held that devil in clear prospect. For the next half-century he was chained up and out of sight. Now perhaps we have loosed him again.”⁴⁰

Malthus’ overpopulation “devil” continued to exert great sway over the rest of the twentieth century. Indeed, during the early post-World War II era, especially from the mid-1950s to the mid-1980s, anti-populationism (and antinatalism) dominated social and foreign policy thinking in the developed world to an extent having few if any historical parallels. This neo-Malthusian resurgence allied itself to extreme views on the scarcity of natural resources (exemplified by Paul Ehrlich’s 1968 bestseller, *The Population Bomb*, and the Club of Rome’s 1972 report, *The Limits to Growth*),⁴¹ and was often combined with more general critiques of “industrial civilization” and the structure of the “bourgeois family.” Domestically, these views favored abandoning or at least de-emphasizing public incentives to get married or have children. Abroad, they favored aggressive campaigns to reduce birthrates in developing countries—not to prevent them from becoming strong and powerful (though some foreign leaders begged to differ), but rather to alleviate their demographic burden, promote economic development, and encourage a democratic way of life.

Yet even during these recent Malthusian centuries, there have been important counter-currents. It is no accident that Malthus’ popularity has roughly coincided with the demographic transition and what Ehrlich rightly called a worldwide “population explosion” unique in human history (a tenfold growth in global population since 1700). Likewise, it is no accident that Malthus has usually fallen out of favor in countries or decades in which population trends have seemed to be moving the other way.

An interesting example is France, which experienced a rapid birthrate decline after Napoleon and hardly any population growth at all after the mid-nineteenth century. In 1870, France lost the Franco-Prussian War—a defeat widely blamed on inadequate troop numbers. Thereafter, it is hard to find any French thinker of much influence who still subscribed to Malthus’ worldview. Instead, leading French intellectuals engaged in endless soul-searching about why the French had so few children, whether feminism was treasonous, whether their static population was a sign of decadence, what sort of pronatalist policies could turn the birthrate around, and indeed whether France could survive another war against Germany’s rapidly expanding population.⁴² In 1900, a French senator announced gravely to the media, “If French wives had the fertility of German women, we would gain 500,000 children per year.”⁴³ The French preoccupation with raising their birthrate ultimately gave rise to generous public maternity benefits that help explain why France (perhaps ironically) today has the highest fertility rate in Europe.

⁴⁰ John M. Keynes, *The Economic Consequences of Peace* (Ranway, NJ: The Quinn & Boden, Co., 1920), 10.

⁴¹ Paul R. Ehrlich and David Brower, *The Population Bomb* (New York: Ballantine Books, 1968); and Donella H. Meadows, et al., *The Limits to Growth* (New York: Universe Books, 1972).

⁴² See discussion in Joseph J. Spengler, *France Faces Depopulation: Postlude Edition, 1936-1976* (Durham, NC: Duke University Press, 1979); and Joshua Cole, *The Power of Large Numbers: Population, Politics, and Gender in Nineteenth-Century France* (Ithaca, NY: Cornell University Press, 2000).

⁴³ Quoted in Joshua Cole (2000), *op. cit.*, 195.

There are also revealing fluctuations in attitudes by decade. By the 1880s and 1890s, fertility had begun to decline throughout most of Western Europe. Combined with cheaper food and a rapid boom in trans-Atlantic shipping (bringing grain to Europe and Europeans to America), the fall in birthrates seemed to alleviate population fears, and Malthusian worries subsided for a time.

A more dramatic reversal occurred in the 1930s. Beset by a new plunge in fertility, a severe economic depression, and new fears of war, leaders and writers throughout the world suddenly blamed slow population growth for everything from unemployment, trade wars, and political unrest to a more fundamental cultural decline. Keynes changed his mind and (with his followers) started to advocate population growth. The demographer Enid Charles wrote *The Twilight of Parenthood* in 1934, in which she announced that “in place of the Malthusian menace of overpopulation there is now a real danger of under-population.”⁴⁴ Oswald Spengler and P.A. Sorokin suggested that demographic decline was a symptom of civilizational exhaustion.⁴⁵ Growing fascist parties advocated vigorous pronatalism as a cornerstone of their policy agenda. These alarmist worries and policy prescriptions climaxed with World War II. Yet even after VE- and VJ-day, they remained strong enough to induce most of the developed nations to incorporate generous family benefits into their postwar social welfare programs.

The neo-Malthusian resurgence of the mid-1950s to the mid-1980s coincided with an era that in many respects was the mirror-image of the 1930s. Starting in the 1950s, the developed world experienced growing affluence and relative freedom from the threat of war. Domestically, it witnessed a renewal of strong population growth—at least until the 1970s. Abroad, it noticed a spectacular acceleration of global population growth as the developing world entered its own demographic transition. From 1950 to 1973, the world population grew at an average annual rate of roughly 2 percent. It had never before grown at such a high rate for so long—nor, from today’s vantage point, does it seem likely to ever do so again. As population projections for the developed countries collapse (an absolute decline over the next 50 years appears to be unavoidable) and as the generation that recalls fascist pronatalism disappears, yet another shift in prevailing attitudes—this time back to worries about population decline—is well underway.

A number of useful themes emerge from this retrospect that will add some historical depth and context to this report.

First, the issue of population and power has an ancient pedigree. Political leaders have worried about it since the dawn of civilization. Over the centuries, moreover, their concern has almost always been to avoid population decline and encourage population growth. From time to time, great minds have expressed a dissenting point of view (Aristotle, for example, once famously wrote that “a great state is not the same as a populous state”), but there is little evidence that leaders listened to such advice (Aristotle’s illustrious Macedonian patrons clearly did not).

⁴⁴ Quoted in Phillip Longman (2004), *op. cit.*, 75.

⁴⁵ Oswald Spengler, *Der Untergang des Abendlandes* (1923); and Pitirim A. Sorokin, *Social and Cultural Dynamics* (New York: American Book Co., 1937).

Second, to the extent that populationism has yielded to an anti-growth and antinatalist agenda, it has done so in eras of unusual population growth. This explains the overall ascendancy of Malthusianism after the late eighteenth century—not just in Europe but in China,⁴⁶ which experienced rapid population growth as well from roughly 1750 to 1850. This also explains why, even over the last two centuries, the direction of thinking and policy tends to shift back and forth with the prevailing (high-growth or low-growth) demographic outlook. As we have suggested, there appears to be a strong link between the sudden downward shift in population projections since the early 1990s, especially in projections for the developed world, and an equally dramatic shift in the public and expert mood toward greater worries about slow growth or no growth.

Third, the favorite policy prescriptions for encouraging population growth have actually changed very little over the centuries. The Senate and emperors of Rome enacted monetary bounties for families with many children, monetary penalties for bachelors, and status-enhancing inducements (like citizenship) for immigrants. Fifteen hundred years later, Louis XIV's finance minister, Jean-Baptiste Colbert, was recommending the same menu of options. And in the capitals of today's developed countries, one finds plenty of policy working papers still pushing a similar program. The U.S. reputation as a nation of immigrants has a direct parallel (disliked by conservatives but admired by neoconservatives) in Rome's own reputation as a "universal empire." Even brutal measures of "demographic engineering" such as deportation, relocation, colonization, and genocide haven't changed much. China and the Soviet Union have used them in this century. So did the Mongols, Turks, Romans, and Assyrians in centuries past.

Fourth, leaders have been perpetually disappointed by their population policies—by how they fail so much more often than they succeed. This has triggered an endless debate over the centuries about how to influence behavior more effectively. The debate has typically pitted paternalists, who believe that people can be made to do their demographic "duty" mostly by means of commands or bribes, against liberals, who believe that better results come from giving people more economic opportunity and a broader range of social and lifestyle freedom. This debate is as alive and well in the twenty-first century as it was in the eighteenth. To raise birthrates, some today advocate policies that would reinforce an exclusive maternal role for women, while others advocate policies that would give women more choices (such as having a career while also raising children). History's track record shows that while the paternalistic policies have usually been enacted, the liberal policies have usually been more effective.

Finally, from ancient times to the present day, there has always been uncertainty about the direction of causation: Does population growth cause a state to be successful at home and abroad? Or is it the other way around—that is, does a state that is successful (for whatever deep social or cultural reason) merely experience population growth as a dimension of that success? Policy advisers have usually leaned toward the first answer, because they and the leaders they counsel like to

⁴⁶ See Gabe T. Wang, *China's Population: Problems, Thoughts and Policies* (Brookfield, VT: Ashgate, 1999).

believe they are in control of the state's destiny. Yet ancient philosophers often inclined toward the latter answer. Many believed in an organic metaphor for the polis: Political societies, like human beings, experience birth, growth, maturity, senescence, and death. Young societies are simple, innocent, virtuous, egalitarian, and tend to have many youths. Old societies are complex, experienced, decadent, and stratified, and tend to have many elders. In time, all societies naturally cycle from young to old and it's not clear whether leaders can do much to interfere.

Among the Greeks, Polybius subscribed to this cyclical view of social and political evolution; among the Romans, Tacitus, Juvenal, and even Petronius; in the Middle Ages, Ibn Khaldun; in the Renaissance, Machiavelli. In the 1920s and 1930s, we associate this view with Spengler's *The Decline of the West* (which was itself inspired by Otto Seeck's *Decline of Antiquity*).⁴⁷ In our own day, we may think of Joseph Tainter's *The Collapse of Complex Societies* or simply Jared Diamond's *Collapse*.⁴⁸ What all of these interpretations have in common is the idea that social evolution—demography included—is governed by a meta-historical dynamic that may not allow much room for leaders or citizens themselves to intervene. Although this doctrine is not one that confident policymakers will easily accept, it also offers some humbling insights that they would do well not to ignore entirely.

So much for what history's leading voices on the subject have thought about the connection between population and power. Let's now turn to a very different issue. What does the past itself say about the connection? What does history suggest about how population—its size, its age structure, and its growth—actually affects a nation's influence and power?

In our view, the historical track record is fairly clear: All other things being equal, size is an advantage. With its larger population, the bigger state can mobilize larger forces and occupy more territory. With its larger economy (due to its larger population), the bigger state can arm and supply larger forces, exert more pressure on global trade and global finance, and enjoy important efficiencies of scale in its markets and public works. With more people and more production, the bigger state can wield more cultural and policy influence on the world stage (soft power) and, if conflict arises, can more easily compel an adversary to settle on terms of its choosing (hard power). Indeed, if the history of war teaches any obvious lessons, one is that victory usually goes to the larger party or alliance—particularly when victory is of critical importance to both sides.

We explain this argument in some detail, and cite data to support it, in Chapter 3. It is as valid for the long term as it is for the near term. Armed with exactly the same reasoning, Alexis de Tocqueville was able to make his astonishing prediction (in 1835!) regarding the United States and Russia. He wrote that one would stand for “freedom” and the other for “servitude.” He also wrote that “each of them seems marked out by the will of Heaven to sway the destinies of half the globe.”⁴⁹ Tocqueville's method, revealed in a footnote, was simple. He observed that these two societies were filling large empty continents, and then he just did the arithmetic.

⁴⁷ Oswald Spengler, *op. cit.*; and Otto Seeck, *Geschichte Des Untergangs Der Antiken* (1909).

⁴⁸ Joseph A. Tainter, *The Collapse of Complex Societies* (Cambridge, UK: Cambridge University Press, 1988); and Jared Diamond, *Collapse: How Societies Choose to Fail or Succeed* (New York: Viking Press, 2005).

⁴⁹ Alexis de Tocqueville, *Democracy in America* (1835).

Here may be a good opportunity, however, to acknowledge some of the limitations of sheer size. Some have suggested that there are important diseconomies of scale—when a state overwhelms its natural environment, for example, or when it becomes overly complex and bureaucratic. These points are well taken. There are cases in which the natural environment literally prevents growth (which is why so many of the Greek city-states promoted emigration and founded new colonies). There are also cases of states becoming so highly evolved and convoluted as they grow that they become dysfunctional (one instance, perhaps, accounting for our word “byzantine”). Similarly, one cannot blindly compare the size of states without regard to their political type. To say, for example, that in 1914 the Austro-Hungarian Empire was “larger” than Britain would not be meaningful, since one was a rambling federation and the other was a modern nation state. Still, while allowing these exceptions and caveats, our overall conclusion stands. Most of the time, it is the larger states that shape the geopolitical order to their liking—an advantage that grows with the degree of crisis and conflict besetting that order.

A further concession is that superior population size, while helpful, hardly guarantees success. Yes, there are many classic instances of total-war struggles for domination in which the larger side came out on top: World War I and World War II, for example, or the U.S. or English Civil Wars. But there are also many counter-examples, such as Queen Elizabeth I against Ferdinand II or Alexander the Great against Darius III. In the early fourteenth century, the Chinese historian Ma Duanlin noted that the Mongols had conquered the Song Dynasty despite their much smaller numbers—and he marveled at how this could happen.⁵⁰ One wonders: Is there perhaps another demographic indicator which may have better or additional predictive value?

An intriguing possibility, suggested by the ancient organic metaphor for state growth and decline, might be to look not just at population size, but at the rate of population growth. To be sure, a high rate of population growth is by no means a *sufficient* condition for success. Most states with high growth rates are not particularly successful, and indeed many are especially prone to poverty, civil unrest, invasion, or all three. Yet a relatively high growth rate may be a *necessary* condition for success. Throughout history, in a remarkable variety of instances, those states or alliances which ultimately prevail over their neighbors turn out to be those whose population is growing faster than their neighbors.⁷ In the ancient world, this was true (at different times) for the Persians, the Greeks, the Macedonians, and the Romans. It was certainly true for the Norse and the Mongols. In modern Western history, it has been true for Portugal in the fifteenth century, the Netherlands in the sixteenth, Russia in the seventeenth, Britain in the eighteenth, Germany in the nineteenth, and the United States in the twentieth. On the other hand, it is difficult to find any major instance of a state whose regional or global stature has risen while its share of the regional or global population has declined.

Ever since Edward Gibbon’s account of the barbarian invasions of the Roman Empire, historians have noted the unusual dynamism and confidence that sometimes characterize high-growth populations. The eminent historian William

⁵⁰ Cited in Gabe T. Wang, *op. cit.*

McNeill, who has written extensively on this subject, believes that demographic pressure—by shattering traditional village and family roles and creating a whole new class of rootless youth looking for opportunities—pushes the entire society toward new and riskier political goals.⁵¹ Often, perhaps most of the time, the energy dissipates. But occasionally a juggernaut is unleashed. McNeill believes that it was demographic pressure that drove the expansion of China and Britain in the eighteenth century, triggered the modernization of Japan after the Meiji Restoration, and pushed Central Europe into both World War I and World War II. He notes that “growing populations do not voluntarily leave their neighbors alone and at ease within existing economic, political, and social frameworks.”⁵² Some academic research confirms that higher-growth societies are more likely to initiate interstate conflict.⁵³

An extreme version of this argument has been advanced by the sociologist Gunnar Heinsohn, who believes that nearly all civic energy and risk-taking (and violence) in history is driven by the “excess sons” of large families who must undertake new enterprises in order to win social status.⁵⁴ In sixteenth-century Spain, these were the “Secondones,” the second sons who became conquistadores because they would inherit no land at home. In the twenty-first century Middle East, he says, they are the prime recruits for terrorist organizations.

The policy implications of this dynamic are subtle. Fast-growing and youthful societies clearly bear close watch due to their greater overall volatility. Sometimes one of these societies will become a regional hegemon—and this will almost always be a society that is growing more rapidly than its neighbors. Beyond these useful lessons, however, the dynamic does not offer either slow- or fast-growing societies any easy formula for success. Like most models that derive from an organic metaphor, it leaves the policymaker searching for a handle. Heinsohn is hesitant to offer concrete recommendations. McNeill merely tantalizes his readers with his own cyclical perspective on the rise and fall of nations.⁵⁵

CONCEPTUAL FRAMEWORK OF THE REPORT

We turn now from our past to our future—our effort to look ahead at the major demographic forces that will be shaping geopolitics until 2050. This effort will require long-term demographic and economic projections. It will also require full disclosure up front about how we assume the next half-century will unfold.

⁵¹ William H. McNeill, *The Pursuit of Power: Technology, Armed Force, and Society Since A.D. 1000* (Chicago: University of Chicago Press, 1982); and William H. McNeill, *Population and Politics Since 1750* (Charlottesville, VA: University Press of Virginia, 1990).

⁵² William H. McNeill (1990), *op. cit.*, 51.

⁵³ *Multidisciplinary Perspectives on Population and Conflict*, ed. Nazli Choucri (Syracuse, NY: Syracuse University Press, 1984); and Jaroslav Tir and Paul F. Diehl, “Demographic Pressure and Interstate Conflict: Linking Population Growth and Density to Militarized Disputes and Wars, 1930-89,” *Journal of Peace Research* 35, no. 3, Special Issue on Environmental Conflict (May 1998).

⁵⁴ Gunnar Heinsohn, *Söhne und Weltmacht: Terror im Aufstieg und Fall der Nationen* (Zurich: Orell Füssli, 2006).

⁵⁵ William H. McNeill (1990), *op. cit.*

Looking ahead 50 years will strike many as a risky exercise in prophecy—and as H.L. Mencken declared, “The prophesying business is like writing fugues; it is fatal to everyone save the man of absolute genius.”⁵⁶

To avoid risk, and to disavow any claim of special prophetic insight, we need to spell out our assumptions and our framework. In general, this report presupposes that the future will resemble the recent past in terms of basic social attitudes, political behavior, and economic trends, except in those instances (and there are many) where we suggest these could shift in response to demographic change. We have nothing to say about the great wild cards of history, such as epidemic disease, nuclear terrorism, renegade nanobots, catastrophic climate change, and so on. They are all obvious and identifiable exceptions to a default or “baseline” future. But there are certain basic assumptions that do merit some discussion because each of them is sure to be violated in some way (large or small) by future events. These are our assumptions about technology, natural resources, social change, and political organization. For the sake of clarity, we also need to explain how our approach is relevant to different schools of geopolitical thought.

Technological change, of course, is one of the great unknowables of our future. For our purposes, the most important impact of any technological surprise will be on global economic performance—specifically, on productivity growth and national income over time. We discuss, in various chapters of this report, how demographic change may influence other major contributors to productivity growth (such as investment, education, public works, and government policies). But what about technology?

Let’s make a couple of speculative observations. On the one hand, if the pace of technological discovery, invention, and innovation lags behind the trend of recent years—pulling down the projected growth rate in global living standards—then the geopolitical consequences will almost certainly be negative. In most of the developing world, disappointing income trends, when added to other development stressors (like unemployment, inequality, urbanization, and religious or ethnic conflict), are strongly associated with higher levels of civil violence and revolution and possibly with movement toward more authoritarian rule (see Chapter 4). In every region, developed and developing, a lasting economic downturn may tend to trigger anti-growth government policies that compound the problem.⁵⁷

On the other hand, if technological progress speeds ahead of trend, then the consequences will probably be mixed. Unexpected prosperity, to be sure, will be helpful to the economic, social, and political development of most low-income nations. This will unambiguously improve the geopolitical environment. Yet as we explain in Chapter 3, higher rates of technological progress hasten the depreciation of existing physical and human capital (most of which is in developed countries) and give an extra edge to younger inventors, innovators, and workers (who are relatively more plentiful in high-growth developing countries). This will quicken the pace at which aspiring low-income economies can expect to catch or surpass today’s high-

⁵⁶ Henry Louis Mencken, *Prejudices: First Series* (New York: Alfred A. Knopf, 1919), 21.

⁵⁷ This argument is set forth at some length in Benjamin M. Friedman, *The Moral Consequences of Economic Growth* (New York: Alfred A. Knopf, 2006).

income economies. From the security perspective of the United States, Europe, or Japan, this may not be regarded as a welcome outcome.

Technological discoveries may also have important consequences for military hardware, training, and tactics and thus for national defense strategy. Here it is more probable, on balance, that a slower rate of innovation will favor the geopolitical outlook for the United States and the developed world. Radical leaps in war technology tend to favor the offense and the element of risk and surprise—and thus, we may assume, tend to favor challengers rather than defenders of the geopolitical order. Also, like radical leaps of technology in the economy, they tend to level the playing field by devaluing existing investments in the prior generation of war technology and by empowering younger military innovators. We summarize these arguments in Chapter 3.

The economics of natural resources, especially fossil fuels, could loom large over the next half-century. Practically every long-term energy projection shows surging demand for fossil fuels as hundreds of millions of families in the developing world (especially in East and South Asia and in Latin America) seek to join a home-owning and car-owning middle class. If, as some energy economists believe, global supply cannot grow nearly as fast, prices will climb to levels far higher than they are today.⁵⁸ The geopolitical consequences of a two- or four-fold jump in energy prices will certainly be negative. For most of the world, it will translate into a significant income loss and lower living standards. However, for some regions and countries—the Arab world, Central Asia, Russia, Iran, Nigeria, and Venezuela—it will translate into a massive income gain. Many of the recipients are already serious security threats and are likely to remain so for the foreseeable future. More importantly, as Chapter 4 explains, most are experiencing extreme demographic changes which will render them potentially unstable (or worse: cohesive and hostile) for decades to come.

Social attitudes and values are also likely to change in important directions that we cannot now foresee. A major set of questions concerns religion. One might speculate on whether religion will become more or less important in the developed world, whether Christianity will continue to spread in sub-Saharan Africa and East Asia, whether Islam will gain more converts among Western Europeans, or whether Islamism will grow more accommodating to democracy as it is reinterpreted by the children and grandchildren of today's extremists.⁵⁹ The answers, we will see, have important implications for fertility as well as for civic behavior and geopolitical sympathies. Other major questions concern the appeal of nationalism, ethnic loyalty, and family values. Many observers believe that both nationalism and ethnic partisanship are today on the rise—especially the two in combination, “ethnonationalism.”⁶⁰ The diminished size of the extended and nuclear family, and

⁵⁸ The “peak oil” thesis is laid out in Matthew R. Simmons, *Twilight in the Desert: The Coming Saudi Oil Shock and the World Economy* (Hoboken, NJ: John Wiley & Sons, 2006).

⁵⁹ For a comprehensive discussion of these questions, see Philip Jenkins, *The Next Christendom: The Coming of Global Christianity* (New York: Oxford University Press, 2002); and *God's Continent: Christianity, Islam, and Europe's Religious Crisis* (New York: Oxford University Press, 2007).

⁶⁰ See *Ethnonationalism in the Contemporary World: Walker Connor and the Study of Nationalism*, ed. Daniele Conversi (London: Routledge, 2002).

the tendency of family social functions to be replaced by government may accelerate this trend (see Chapters 2 and 3).

Forms of political organization may continue to evolve in the future, just as they have in the past. Over the last several centuries, and especially since the mid-nineteenth century, the unified nation state has vastly increased its size, resources, and legitimacy at the expense of almost every other type of civic affiliation. During the decade following the end of the Cold War, a period that saw the dissolution of the Soviet Union, the birth of the EU, and the expansion of NATO, many experts predicted that this concentration of national power might soon unravel. In its place, they suggested, the world might gravitate toward a decentralized, variegated arrangement (sometimes called “neo-medieval” or “post-Westphalian”) that would allow stronger government on both a supra-national and regional scale.⁶¹

We reject this suggestion. This report assumes that the nation state, region by region, will remain at least as powerful as it is today. We do so in part because nationalism has recently demonstrated a popular resurgence (in Russia most of all).⁶² But we do so as well because, as a longer-term proposition, the nation state almost always grows stronger during eras of global stress, instability, and threat of conflict—and also during eras in which a growing share of all citizens depend on the state for their support. We believe that all of the developed world and much of the developing world is now entering an era in which demographic change will ensure that both conditions prevail.

Finally, it is worth reflecting on how our basic approach should, and should not, be interpreted by today’s major schools of geopolitical thought. There is no denying that demographic change as a force in history has always been considered a staple of the realist school. It is linked to concerns about group survival having deep roots in our biology. It tends to focus more on the ability to survive and dominate rather than the ability to influence and cooperate. It is sometimes used to justify traditional family structures (as pronatalist) and criticize new and unconventional social norms (as antinatalist). Idealists might complain that to focus on population and power is to focus more on who we are than on who we should be—to which realists might respond that who we should be can never escape the limits of who we are.

All this is granted. Yet we hope, in important respects, that this report transcends the conventional realist perspective. We pay close attention to how demographic change affects attitudes and aspirations, not just how it determines numbers and wealth. Unlike classical realists, we use a method that is both historical and global. We follow the path of each country’s social and economic development, and we acknowledge that the geopolitical order depends upon a working “world system.” By failing to regard demographic trends as global phenomena, many realists do not appreciate their full significance. Nor, in our review of fertility trends in Chapter 2, do we find any evidence that a return to conventional gender roles would raise birthrates. To the contrary, the persistence of traditional family structures in countries like Japan, South Korea, and Italy is one reason their fertility rates are so low.

⁶¹ See for example Andrew Linklater, “Citizenship and Sovereignty in the Post-Westphalian State,” *European Journal of International Relations* 2, no. 1 (1996).

⁶² See Azar Gat, “The Return of the Authoritarian Great Powers,” *Foreign Affairs* (July/August, 2007).

We hope, as well, that foreign-policy idealists may find our conclusions useful, if not always welcome. Many in this camp, for example, favor stronger global governance led by the developed countries, within which the United States would play a smaller role. Demographic trends, however, point in just the opposite direction: to a weaker developed-world presence, within which the United States will be playing a larger role. Some would like to see market capitalism cover Africa by mid-century, or liberal democracy take root throughout Asia. Some would like to see closer ties between North America and Europe—and to see governments on both continents spend much larger sums on global development assistance. Some would like to see these governments rely increasingly on soft power (that is, an attractive cultural and ideological message) to orchestrate affairs in an increasingly pacific world community. The following chapters explain why none of these futures is especially likely.

We choose no side in the contest over world views. We agree that states make choices based on their own interests. We also agree that states can cooperate and build a better world. Instead, we simply offer a wake-up call. Both schools, realist and idealist, have been slow to focus on the massive demographic riptide due to sweep over the world during the next several decades. We need to improve the projections, debate their implications, and determine our strategic responses. Preparing for the 2020s and navigating the decades beyond will call on contributions from all schools of thought. It is a mission that will challenge the planning skills of every policymaker and the leadership skills of every statesperson.

THE DEVELOPED WORLD: ASSESSING THE PROJECTIONS

The developed world is fast approaching a demographic tipping point. For the past quarter-century, most developed countries have enjoyed a period of relatively favorable demographics in which population trends have leaned with economic growth. Although the number of elderly has been growing, the number of children has declined more rapidly, driving society's total demographic "dependency burden" to historic lows. Meanwhile, the share of the developed world's population in the traditional working years has reached a high-tide mark. At 61 percent in 2005, it has never before been so high in history and in all likelihood will never be so high again.

The demographic climate is about to change abruptly. Beginning around 2010, the ratio of elderly to working-age adults will begin to rise rapidly in most developed countries, pushing the total dependency burden up along with it. Overall, there are now 26 elders in the developed world for every 100 working-age adults, but by 2030 there will be 42 and by 2050 there will be 49. In Western Europe and Japan, the ratio will climb much higher—to 59 and 81, respectively.

Most developed countries will not only have aging populations, but stagnant or contracting ones—the only significant exception being the United States. The number of children has already peaked and begun to decline in almost every developed country. The working-age population has also peaked in several large countries, including Germany, Italy, and Japan, and will peak almost everywhere else by 2015. The total population of most countries will continue to grow for a while longer, but only because the decline in the number of children and working-age adults will be offset by the explosive growth in the number of elderly. Still, by the mid-2020s, growth in the total population will also stall or reverse in every major developed country other than the United States.

The moment of maximum demographic stress in the developed world will arrive sometime during the 2020s. In almost every country, the period of most rapid growth in the old-age dependency ratio, and along with it the fiscal burden of old-age benefit programs, will occur during the 2010s and 2020s. Thereafter, the aging trend will begin to slow in most countries, the main exceptions being Ireland, Italy, Japan, Portugal, and Spain. In a few countries, including the United States, virtually the entire age shift will already be complete by the end of the 2020s. The 2020s will also be the decade in which many developed countries first begin to experience large

declines in their working-age populations—and perhaps absolute stagnation in real GDP growth as well.

This chapter explores the timing and magnitude of demographic aging in the developed world, as well as its potential impact on government budgets and GDPs. In the first section, we compare and contrast the demographic outlook in different countries and regions, while noting some of the key economic, social, and cultural factors that may help or hinder adjustments to population aging and decline. In the second section, we take a step back and discuss the underlying demographic drivers and the sensitivity of the projections to changes in assumptions. In the final section, we turn to the impact of rising old-age dependency ratios on government budgets and of more slowly growing or declining working-age populations on employment and GDP growth.

A TOUR OF THE DEVELOPED WORLD

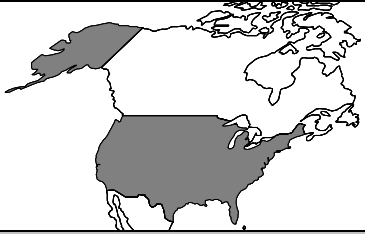
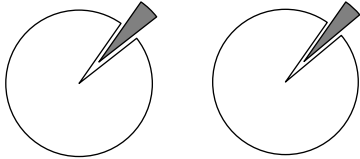
Although the entire developed world is aging, the magnitude of the demographic transformation varies considerably from country to country. Differences in fertility, life expectancy, and immigration all affect the severity of the aging trend—but it is fertility, which has fallen much farther in some countries than others, that is far and away the dominant factor. The timing, though not the ultimate extent, of the transformation is also influenced by the aging of postwar baby booms, which were particularly large in the United States and most other English-speaking countries. As the baby boom has moved through youth and middle age, it has slowed the rise in the old-age dependency burden—but when the baby boom arrives in old age, it will accelerate it.

The following profiles compare and contrast the demographic outlook in the United States, the rest of the English-speaking world, Western Europe, and Japan. The profiles also note some of the economic, social, and cultural factors that may make it easier or harder for countries to adjust to the new demographic climate, and in particular rising old-age dependency burdens and more slowly growing or contracting working-age populations. Often, the demographic trends and this broader context push in the same direction. The United States and the other English-speaking countries, for instance, have the most favorable demographics—and the least expensive old-age benefit systems. Most Western European countries face much larger age waves—and have much more expansive welfare states. Japan is in some respects a unique case. Although it faces an age wave of massive proportions, relatively low levels of elder dependence on government may give it an advantage that most European countries do not enjoy.

The United States

The United States has long been known for its “exceptionalism” in the political and cultural spheres. But as demographer Nicholas Eberstadt points out, there is also an “American demographic exceptionalism.”¹ With slightly more than 2.0 average

¹ Nicholas Eberstadt, “Born in the USA,” *The American Interest* 3, no. 2 (May/June 2007).

United States					
		2005	2030	2050	
		Fertility Rate	2.0	2.0	2.0
Life Expectancy	77.4	80.7	83.1		
Total Population	300	371	419		
(mil. & % change from 2005)		+24%	+40%		
Working-Age Population	179	205	230		
(mil. & % change from 2005)		+14%	+28%		
Percent of World Population		Median Age	36.0	38.6	39.6
		Youth Bulge Share	18.0%	16.0%	15.5%
2005 = 4.6%	2050 = 4.1%	Elderly Share	12.3%	19.1%	20.2%
		Total Dependency Ratio	68	81	82
		Youth Dep. Ratio	47	47	46
		Old-Age Dep. Ratio	21	35	37

lifetime births per woman, the United States has the highest fertility rate in the developed world—and along with France, Iceland, Ireland, and New Zealand is the only country whose fertility rate approaches the 2.1 replacement level needed to maintain a stable population from one generation to the next. It is also one of the few countries able to absorb large waves of immigrants without, to borrow Eberstadt's phrase, suffering "cultural indigestion." With a median age of 36 in 2005, an elder share of 12 percent, and an old-age dependency ratio of just 21, the United States is by any measure one of the very youngest of the developed countries. What's more, the age gap between the United States and the rest of the developed world is due to widen, not narrow. While the U.S. median age will rise by four years between 2005 and 2050 (from 36 to 40), Western Europe's will rise by nine years (from 40 to 49) and Japan's by thirteen years (from 43 to 56). In 2050, when 20 percent of Americans will be elderly, 31 percent of Western Europeans will be and 39 percent of Japanese.

This emerging age gap will be accompanied by a growth gap. While the rest of the developed world is due to lose 18 million inhabitants between 2005 and 2050, the United States is due to gain 119 million. By the mid-2020s, the United States would be the only major developed country with more children under age 20 than elders over age 65—and along with Australia, Ireland, Luxembourg, and New Zealand the only one whose working-age population would still be growing.

Although the United States will not grow as old as other developed countries, its age wave will arrive with unusual speed. For the past several decades, America's large postwar baby boom generation, born between the mid-1940s and mid-1960s, has been swelling the ranks of working-age adults—and depressing the old-age dependency ratio, which has been virtually flat at between 19 and 21 since the early 1970s. Between 2010 and 2030, however, as the baby boomers pass the threshold of

old age, the old-age dependency ratio will leap upward, to 27 in 2020 and to 35 in 2030. While the period of most rapid population aging in most other developed countries will also occur between 2010 and 2030, in the United States over four-fifths of the upward shift in the old-age dependency ratio projected between 2005 and 2050 will take place during these two decades alone. The sudden shock to public budgets and labor markets could pose a major challenge for a country that has become accustomed to unusually sunny demographics.


To be sure, the United States enjoys some enviable advantages in confronting its age wave. Its public pension system, Social Security, is far less generous than most European systems—and in fact, will still cost less in 2030, after the last of the baby boomers have retired, than many European systems already do today. The United States also has a large private pension system that helps reduce elder dependence on government and take pressure off public budgets. Meanwhile, with its dynamic economy and flexible labor markets, the United States may find it easier than many other developed countries to offset slower growth in the working-age population by boosting labor-force participation rates, particularly among older adults. Indeed, with an elderly labor-force participation rate that is higher than that of any other developed country except Japan, Portugal, and Iceland, the United States already has a considerable head start.

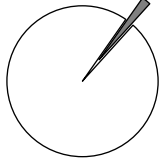
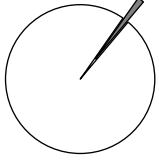
At the same time, however, the United States must overcome some notable disadvantages. It has an extraordinarily expensive health-care system whose rising cost threatens to overwhelm its advantage in pensions. It is running large structural budget deficits even before the age wave rolls in. And its national savings rate is among the lowest in the developed world, leaving it heavily dependent on foreign capital to maintain even minimal rates of domestic investment. The U.S. public, moreover, tends to view government old-age benefit programs as “entitlements” or “earned rights,” which means that reforming them may prove even more difficult than rewriting social contracts in Europe’s aging welfare states. And in fact the United States is one of the few developed countries that has yet to take any significant step to control the future old-age dependency burden. Instead, it recently heaped on vast new costs with the addition of a prescription drug benefit to Medicare, its elderly health benefit program. All of this could leave the United States with little more fiscal room to maneuver than many more rapidly aging countries.

Other English-Speaking Countries

The other English-speaking countries—Australia, Canada, Ireland, New Zealand, and the UK—have much in common with the United States demographically. All, with the exception of the UK, are younger than the developed-country average. All currently have high net immigration rates, and in the case of Australia and Canada, a long history of assimilating migrants. Like the United States, moreover, three of the countries—Australia, Canada, and New Zealand—had unusually large postwar baby booms.

There is, however, an important difference: lower fertility. Although fertility rates approach U.S. levels in Ireland and New Zealand, they have slipped well beneath replacement in Australia (1.8), the UK (1.7), and Canada (1.5). As a result, these countries will age much more than the United States, despite substantial net

Other English-Speaking Countries					
	2005	2030	2050		
	Fertility Rate	1.7	1.7	1.7	
	Life Expectancy	79.2	82.6	84.8	
	Total Population	121	139	145	
	(mil. & % change from 2005)		+15%	+20%	
	Working-Age Population	73	79	79	
	(mil. & % change from 2005)		+7%	+8%	
	Median Age	38.1	43.0	45.6	
	Youth Bulge Share	16.4%	13.3%	12.5%	
	Elderly Share	14.5%	22.1%	25.5%	
Total Dependency Ratio	65	77	83		
Youth Dep. Ratio	41	37	36		
Old-Age Dep. Ratio	24	39	47		


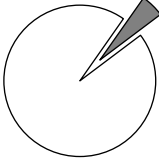
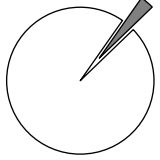
Percent of World Population	
	
2005 = 1.9%	2050 = 1.4%

immigration. By 2050, the elder share of the population is due to rise to 25 percent in Australia, 26 percent in the UK, and 27 percent in Canada—higher than in some continental European countries. In every other English-speaking country except Ireland, moreover, the growth in the working-age population will slow to a virtual standstill by the mid-2020s—and in Canada and the UK working-age populations will begin to decline.

Although the other English-speaking countries face a more challenging demographic future than the United States, they enjoy some of the same advantages, including flexible labor markets, well-developed private pension systems, and, except for Canada and the UK, relatively small public sectors and low tax burdens. Indeed, when it comes to the crucial challenge of managing rising old-age dependency costs, the other English-speaking countries may actually be better positioned than the United States. Public pension systems are no more generous—and in some cases, considerably less generous—while per capita health-care costs are lower and have generally been growing more slowly. In the case of Australia, the public pension system is means-tested and the private pension system is mandatory and universal, which may leave that country better prepared to confront its age wave than any other developed country.

Western Europe

The aging of Western Europe is about to give a whole new meaning to the term “Old World.” Overall, the elder share of Western Europe’s population, already 18 percent, is projected to rise to 25 percent by 2030 and to 31 percent by 2050. Meanwhile, its working-age population will peak by 2015 and begin to decline. By 2030, there will be 6 percent fewer working-age adults than there are today; by 2050, there will be 18 percent fewer.

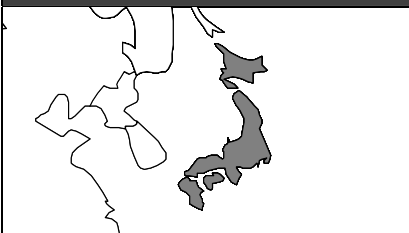
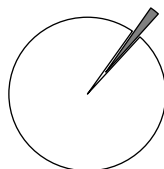
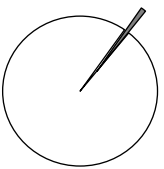
Western Europe				
		2005	2030	2050
	Fertility Rate		1.5	1.5
Life Expectancy		79.3	82.5	84.7
Total Population		324	328	311
(mil. & % change from 2005)			+1%	-4%
Working-Age Population		198	185	162
(mil. & % change from 2005)			-6%	-18%
Median Age		40.4	47.2	49.5
Youth Bulge Share		14.0%	11.7%	10.9%
Elderly Share		17.5%	25.4%	30.6%
Total Dependency Ratio		64	77	92
Youth Dep. Ratio		35	32	33
Old-Age Dep. Ratio		29	45	59
Percent of World Population				
				
2005 = 5.0%	2050 = 3.1%			

Although all of Western Europe faces a major demographic challenge, the aging trend is much more severe in some countries than others. In fact, from a demographic perspective, there are really two Europes, with different fertility rates and demographic outlooks. In Western Europe's "high-fertility zone," which includes France, Belgium, the Netherlands, and the Nordic countries, the fertility rate registers a relatively buoyant 1.8, actually slightly above the average for the other English-speaking countries. In Western Europe's "low-fertility zone," which includes Germany, Austria, Switzerland, Italy, and the Iberian countries, the fertility rate has sunk all the way to 1.3, on par with Japan's. If the outlook for the first zone is serious, the outlook for the second can only be described as bleak. Here the elder share of the population is projected to reach 34 percent by 2050 (compared with 26 percent in the high-fertility zone) and the working-age population to decline by 26 percent (compared with 3 percent).

Whether high-zone or low-zone, most Western European countries face formidable economic, social, and cultural obstacles in confronting their age waves. Although the broader environment varies considerably across Europe, almost all countries have large public sectors, high tax rates, and rigid labor market regulations that may make it difficult for them to mobilize their human resources as working-age populations stagnate or decline. Most also have generous public pension systems that often allow retirement with full benefits in the late 50s or early 60s. Ominously, it is Europe's largest economies that have some of the most generous systems. As a share of GDP, Germany, France, and Italy each now spend at least twice what the United States does on public pensions. And though, as we will see, a number of Western European countries have recently enacted reforms that promise to cut future benefit levels, it is unclear whether the reforms are economically or politically sustainable given the high level of elder dependence on government benefits. Outside of a few small countries, notably the Netherlands and Switzerland, private

pensions are virtually unknown. Meanwhile, with a few exceptions, mainly among the Nordic countries, elderly labor-force participation rates are vanishingly low. While 19.8 percent of elderly men are still on the job in the United States, only 6.0 percent are in Italy, 5.1 percent in Germany, and 1.7 percent in France.

Population aging not only poses a serious challenge for Europe's national governments, but for the institutions of the European Union—and in particular Europe's Economic and Monetary Union, or EMU. The viability of the EMU depends on the successful coordination of fiscal policy among member countries. Yet such coordination may become increasingly difficult as the fiscal pressures of aging mount—and do so at widely different rates in different countries. Some governments may rise to the fiscal challenge and rein in spending. But if others do not, they could end up unleashing inflation on the prudent and profligate alike. Indeed, this very prospect may be one reason why the UK, with its more favorable demographic and fiscal outlook, has been reluctant join the EMU.

Japan				
		2005	2030	2050
		Fertility Rate	1.3	1.3
	Life Expectancy	81.9	85.2	87.1
	Total Population	128	118	99
	(mil. & % change from 2005)		-8%	-22%
	Working-Age Population	78	64	48
	(mil. & % change from 2005)		-18%	-39%
Percent of World Population				
		42.9	52.3	56.2
		12.8%	9.8%	8.5%
	Median Age	19.7%	30.8%	38.9%
	Total Dependency Ratio	63	83	109
	Youth Dep. Ratio	31	26	28
	Old-Age Dep. Ratio	32	56	81

Japan

Japan is ground zero for demographic aging. It not only faces an age wave that is larger than that of any other developed country, but one that is approaching much faster. As recently as 1980, Japan, with an elder share of just 9 percent, was the youngest of the developed countries. Yet by 2005, Japan's elder share had more than doubled to 20 percent, tying it with Italy for the oldest country on earth. That share will continue to rise steeply in the decades ahead, reaching 31 percent by 2030 and 39 percent by 2050—well above the levels projected for Spain (37 percent) and Italy (35 percent), the next two runners up. Meanwhile, Japan's population will enter a precipitous decline. In fact, the decline has already begun. Japan's working-age population has been contracting since 2000 and its total population since 2005.

By 2050, there will be 22 percent fewer Japanese than there are today—and 39 percent fewer working-age adults.

Japan's massive age wave is the result of a perfect demographic storm: plunging fertility, soaring life expectancy, and negligible net immigration. At just 1.3, the Japanese fertility rate is now lower than that of any developed country except Italy and Spain—and, moreover, it has been at or beneath replacement throughout the past half-century, longer than in any other country. Meanwhile, since the early 1950s, Japanese life expectancy has risen by an impressive 18 years, a bigger gain than in any developed country except Portugal. Life expectancy in Japan now stands at 82, making it the world longevity leader by a comfortable margin. In most of the developed world, the period of most rapid aging still lies over the horizon. In Japan, the age wave has been rolling in continuously for decades—and will continue to do so for decades to come.

As it confronts this daunting demographic future, Japan enjoys a few compensating advantages. The aging trend in Japan may be even more severe than in Europe's fastest-aging countries, but the level of elder dependence on government benefits is far lower. Public pensions in Japan replace a relatively low share of wages by European standards, elderly labor-force participation rates are the highest in the developed world, and, with nearly 50 percent of elders living with their grown children, extended families still play an important role in old-age income support. Traditional Japanese culture, moreover, stresses consensus building and shared sacrifice, which could make adjusting the social contract easier than in Western Europe—or the United States. These factors may allow Japan to manage the social and economic costs of its rapidly aging population, at least for a while. In the very long run, the aging trend is so severe that it is difficult to imagine an effective solution unless fertility rises.

A CLOSER LOOK AT THE DRIVERS

The ultimate origins of the aging challenge now facing the developed world are to be found in the late eighteenth and early nineteenth centuries, when mortality and fertility rates first began to fall. Demographers have a name for the shift from high mortality and high fertility (the traditional norm) to low mortality and low fertility (the modern norm). They call it the demographic transition. It seems to be an inevitable consequence of economic and social development—and so far at least, it appears to be irreversible.

The early stages of the demographic transition are characterized by surging population growth, since mortality (and especially infant and child mortality) usually begin to fall well before fertility does. As the transition proceeds, and fertility rates fall as well, population growth slows, the relative number of young begins to decline, median ages rise, and the share of the population in the working ages climbs rapidly. Along the way, societies may enjoy the benefits of a temporary “demographic dividend” as low dependency ratios and large working-age populations boost employment, savings, investment, and economic growth. Eventually, however, the relative growth in the number of elderly overtakes the

relative decline in the number of young—and, at least in theory, a new population equilibrium is reached.

For years, demographers assumed that fertility in the developed world would stabilize at the so-called 2.1 replacement rate—the number of average lifetime births per woman that is required, in a modern society with low mortality rates, to keep the population stable from one generation to the next. But this has not happened. Fertility rates in almost every developed country have now been beneath replacement for more than a generation—in most cases far beneath it—and show few signs of rising. Demographers also long assumed that improvements in mortality would slow over time and that life expectancy would eventually plateau. But this doesn't appear to be happening either. The result is that, rather than a new equilibrium, much of the developed world now faces a future of hyper-aging and population decline.

In our population projections for the developed world, we use the UN's 2006 "constant fertility variant." On balance, we believe that this projection is conservative in the sense that it is more likely to understate than overstate the future aging of the population. It assumes that fertility in each country will remain unchanged at its 2000 to 2005 average, even though "completed cohort fertility"—that is, the average number of lifetime births born to a cohort of women ending its childbearing years—has been falling in virtually every developed country for each successive birth cohort since 1930.² The projection allows for a continued increase in life expectancy, but assumes that it will grow at a slower rate in the future than it has in the past. It also assumes that net immigration will remain at historically high levels in most countries, despite the current drift toward more restrictionist policies on both sides of the Atlantic.

We also believe that this projection is more realistic than the UN's more commonly cited "medium variant," which assumes that fertility in all developed countries will eventually converge to a rate of 1.85—rising in the majority of countries where it is now lower and falling in the few, like the United States, where it is now higher. There is little empirical evidence that fertility rates are poised to rise significantly and no theoretical support for the convergence assumption. The choice of scenario, however, makes only a small difference over our projection horizon, since the convergence in fertility rates in the UN's medium variant occurs very gradually. Under both scenarios—and indeed, under any plausible scenario—the developed world will age massively over the next half-century. For better or worse, it will have to cope with the consequences.

Fertility

The trend toward smaller families is one of the most enduring social developments of modern times. Fertility rates in most of the developed world fell almost continuously throughout the nineteenth and early twentieth centuries—dropping from just over 7 in the United States in 1800 and from between 4 and 6 in Western

² Tomas Frejka and Jean-Paul Sardon, "The Direction of Contemporary Fertility Trends in the Developed Countries: Further Decline, Plateau or Upswing?" (paper presented at the 25th IUSSP International Conference, Tours, France, July 18-23, 2005).

Europe to near the 2.1 replacement level by the 1930s. The decline was temporarily arrested and in some countries reversed after the Second World War, most dramatically in the United States and the other English-speaking countries, which experienced large postwar baby booms. But fertility rates once again resumed their downward descent in the 1960s, plunging beneath replacement in most countries by the 1970s, where they have remained ever since. While popular accounts often treat today's baby bust as an aberration, the aberration was in fact the baby boom.

The decline in fertility has been driven by the powerful economic, social, and cultural currents of modernization. In the early stages, the decisive factors were industrialization, rising affluence, and the evolution of a middle-class ethos that emphasized investment in the "quality" rather than quantity of children—as well, of course, as declining infant and child mortality, which meant that fewer births were needed to achieve any desired family size. More recently, the dramatic transformation in the social role of women and the structure of the family have accelerated the decline. The increase in female educational attainment, the massive entry of women into the labor force, and the rising average age of marriage and childbirth have all played a role in depressing fertility over the past few decades. So too has the widespread diffusion of effective contraception and the legalization of abortion. Another key development may have been the expansion of universal social insurance programs, which weakened one of the oldest incentives for having children: support in old age.

Although the forces of modernization have driven down fertility everywhere, they have of course driven it down further in some countries than in others. Part of the explanation may lie in such imponderables as a country's "national character" and its overall sense of optimism or pessimism about the future. Part may also lie in a country's degree of religiosity or secularism. The United States, the developed world's undisputed fertility leader, is by any measure far more religious than Western Europe or Japan. But there are also more tangible economic, social, and cultural differences that explain much of the variation in fertility across the developed world.

Countries where women can more easily balance the conflicting demands of jobs and children tend to have higher fertility rates. Public policies in most of the countries of Northern Europe reduce the opportunity cost of children for working women—through cash benefits to families with children, subsidized day care, and mandates that employers offer new mothers generous paid maternity leave and job guarantees. And though public policies in the United States and the other English-speaking countries tend to be less supportive, flexible labor markets achieve much the same result by allowing women to more easily exit and reenter the workforce when they decide to have children. In most of the developed world's relatively high-fertility countries, moreover, expectations about the social role of women have changed in ways that support—or at least do not stigmatize—their decision to have both jobs and children. In contrast, in Japan, Germany, Italy, and the other countries of Europe's low-fertility zone, where family and workplace cultures remain more conservative, jobs and children often confront women with a zero-sum trade-off. Paradoxically, these countries now have both the lowest female labor-force participation rates *and* the lowest fertility rates in the developed world.

The overall economic climate facing young adults is also an important variable. The comparative ease with which young adults in the United States can launch careers and establish independent households encourages them to start families—and to start them at relatively young ages, which gives women more time to have children. On average, U.S. women give birth to their first child at 25, the youngest age of any developed country. In Europe, where career plans are often placed on endless hold amid high youth unemployment and housing is scarce and expensive, and in Japan, with its rigid seniority pay system and even tighter housing markets, young adults on average start their families two-to-four years later.³ The delay in childbearing has lowered fertility, though it has lowered it less in the countries of Northern Europe, with their generous family benefits and accommodating social environment, than it has in Japan, Germany, and the countries of Southern Europe.

Some countries also owe their higher fertility, at least in part, to the higher fertility of immigrant populations. The higher fertility rate of Hispanic Americans—which weighed in at 2.8 in 2004, compared with 1.9 for non-Hispanic whites and 2.0 for non-Hispanic blacks⁴—boosts the U.S. fertility rate by nearly 10 percent and accounts for roughly one-third of the difference between the U.S. rate and the developed-country average. Even without Hispanic immigrants, the United States would still enjoy a considerable fertility advantage over almost every other developed country, though the advantage would be smaller. The higher fertility of immigrants, and particularly Muslims, also appears to raise the overall fertility rate in many European countries—to the extent one can draw conclusions from the incomplete and contradictory official data. In France, for example, the fertility rate of foreign women has remained steady at 2.8 for many years, which is about two-thirds higher than the average for all French women. The fertility rate of foreign Muslim women is even higher at 3.4, although it is generally conceded that this rate declines with citizenship and years of residence.⁵

Wherever today's developed countries fall on the spectrum, all have fertility rates that are very low by historical standards—and in many cases, fertility has fallen to levels that demographers would have considered unthinkable just a few decades ago. The question naturally arises: Is below-replacement fertility the ultimate end point of the demographic transition in the developed world or will fertility eventually recover? Although demographic science can offer no definitive answer to the question, the prospects for a broad fertility rebound seem remote.

In the great majority of developed countries, fertility has been beneath replacement for at least 30 years—and in some cases, far beneath replacement. To be sure, the news has recently been filled with reports of rising birthrates in a number of European countries.⁶ The increases, however, have generally been small.

³ “European Demographic Data Sheet 2006,” *POPNET*, no. 38 (Laxenburg: International Institute for Applied Systems Analysis, Fall 2006).

⁴ Joyce A. Martin *et al.*, *National Vital Statistics Reports* 55, no. 1 (Hyattsville, MD: National Center for Health Statistics, September 29, 2006), 55.

⁵ François Legros, “La fécondité des étrangères en France: une stabilisation entre 1990 et 1999,” *INSEE Première* no. 898 (Paris: Institut National de la Statistique et des Études Économiques, May 2003).

⁶ See for instance: Jeffrey Stinson, “Euro-Babies Go from Bust to Boom,” *USA Today*, August 16, 2007; Bertrand Benoit, “Baby Boom Times for Germany,” *The Financial Times*, July 14, 2007; Polly

In only five countries—Belgium, France, Italy, the Netherlands, and Spain—is the fertility rate now more than one-tenth of a percentage point higher than it was a decade ago. The largest increase has been in France, where the fertility rate has risen from 1.7 in 1995 to 1.9 in 2005 and an estimated 2.0 in 2006.⁷ Interestingly a large share (perhaps half) of the total increase in births has been due to a marked increase in the fertility of France’s sizeable population of immigrant mothers, especially Muslim mothers.⁸ Notwithstanding the higher fertility rate of immigrants, most demographers do not believe that the recent uptick in fertility heralds a major turnaround in the long-term trend. In most countries, it appears to be the result of a temporary “timing shift” that will soon run its course.

In calculating the current-year fertility rate—technically called a “total” or “period” fertility rate—demographers assume that women will, over the course of their lifetimes, exhibit the observed fertility behavior of women at each age in that year. When age-specific patterns of childbearing remain unchanged over time, period fertility rates and actual cohort fertility rates are the same. But when women postpone childbearing to older ages, as they have done to a greater or lesser extent in every developed country since the 1960s, the period rate can temporarily underestimate the true cohort rate. Once the timing shift is complete, the period fertility rate will recover—at least partially. In some countries, including the United States, this dynamic has already unfolded. After plunging from 3.7 in the mid-1950s to 1.7 in the mid-1970s, the U.S. fertility rate rose to 2.0 by the early 1990s under the impact of late-birthing boomers, where it has remained ever since. In some European countries, where fertility plunged later and/or women have postponed childbearing longer, the timing shift is not yet complete.

While the timing shift is real, its potential to raise fertility is limited. In the United States, boomers only recuperated a fraction of the births in their 30s and 40s that they didn’t have in their 20s—and European women are unlikely to fare much better. The prospects are especially dim in Germany and the countries of Southern Europe, where the difficulties that women face in balancing jobs and children make recuperation more difficult. In any case, fertility rates among younger women in these countries have sunk so low that a return to anything approaching replacement fertility would require very large increases in fertility rates among older women. In Germany, Italy, and Spain, age-specific fertility rates among women in their 30s would have to more than double to raise the overall fertility rate to the replacement level. Unless women in their 20s once again start having a lot more babies, fertility is unlikely to rise substantially—and this does not appear to be happening anywhere.⁹

Worried by persistent below-replacement fertility—and projections of soaring old-age dependency costs and contracting workforces—governments in some of the

Curtis and Tania Branigan, “Hints of a Baby Boom As Fertility Rate Hits Highest Level for 26 Years,” *The Guardian*, June 8, 2007.

⁷ Eurostat Reference Database, Eurostat, <http://epp.eurostat.ec.europa.eu/>.

⁸ France Prioux, “L’évolution démographique récente en France,” *Population Paris* 61, no. 4 (Paris: Institut national d’études démographiques, 2006); *Données détaillées: thème Population*, <http://www.insee.fr/>.

⁹ For age-specific fertility data, see International Data Base, U.S. Census Bureau, <http://www.census.gov/ipc/www/idb/>.

developed world's lowest-fertility countries are now turning to pronatal policies in an effort to encourage larger families. For many countries, this represents a radical departure. Although France has a long tradition of explicit government pronatalism, and government policies that subsidize working mothers in Sweden and many other Northern European countries are in effect pronatal, the shadow of fascist and totalitarian population policy long made encouraging births taboo in the rest of Europe and in Japan.

This is now changing. Germany's Prime Minister Angela Merkel, departing from the government's longstanding policy of fertility neutrality, openly acknowledges that "Germany needs to be more child-friendly."¹⁰ Her government has announced plans to increase the number of state-financed daycare facilities, and in January 2007 it introduced a new parental leave benefit. The Spanish government recently started paying new parents cash "baby bonuses" and is debating expanded tax breaks for families with children, while in Japan the government and employers have promulgated a new "work-life balance charter" that includes shorter work days for women with children. Portugal has even considered—but in the face of union opposition rejected—linking the generosity of public pension benefits to the number of children people have.

There is little question that a well-designed system of pronatal policies can make a difference. Although demographers disagree about the magnitude of the impact, most concur that pronatalism, broadly defined to include policies that help women balance jobs and children, has played a role in arresting the fertility decline in some Northern European countries—and, along with the timing shift, may help to account for recent gains. Success, however, is far from guaranteed. Experience teaches that policies must be permanent to be effective. One-time financial incentives may induce families to move up the timing of planned births, but are unlikely to alter the long-term fertility trend. Policies also need to be comprehensive and include provisions for daycare and parental leave in addition to cash benefits or tax breaks. Even then, they may not have much effect unless accompanied by broader changes in the workplace and family culture. Mothers with small children who work outside the home no longer provoke any comment in France or Sweden, where this has become the new social norm, but often meet with disapproval in countries like Germany, Italy, and Japan.

An effective pronatal agenda is also expensive. France, Sweden, and many other Northern European countries spend between 3 percent and 4 percent of GDP on direct government benefits to families with children, whereas Germany spends just 2 percent and Italy and Japan just 1 percent.¹¹ Finding the fiscal resources to expand pronatal programs will be a major challenge for countries where government budgets will be under relentless pressure from rising old-age benefit costs. A successful pronatal agenda, moreover, can take many years to develop and implement. France, the birthplace of modern pronatalism, began work on the project nearly a century ago.

¹⁰ Mike Swanson, "German Minister Revamps Family Policies," *Deutsche Presse-Agentur*, April 3, 2007.

¹¹ Social Expenditure Database (SOCX), 1980-2003 (Paris: OECD, 2007).

If time is what it takes to launch an effective pronatal agenda, time may have already run out in many of today's low-fertility countries. Until recently, "ideal" fertility—that is, the number of children that women say is optimal—remained at or above replacement in every developed country, even as actual fertility rates fell far beneath it. This suggested that there might be room for a substantial rebound if more supportive policies simply allowed women to actualize their ideal. But in a growing number of countries, including Austria, Italy, and Germany, ideal fertility has now also dropped well beneath replacement.¹² What's happened, according to some demographers, is that young adults in today's lowest-fertility countries, having spent their entire lives in societies where children are rare, have acquired a "culture of low fertility."¹³ Wolfgang Lutz calls the dynamic the "low-fertility trap," and predicts that it will lead to a self-perpetuating downward spiral, with each successive generation coming of age in a lower-fertility environment and themselves aspiring to even lower fertility. Lutz places the threshold fertility level for the trap at around 1.5—an admittedly arbitrary number, but one lent some support by the fact that no country where fertility has sunk beneath 1.5 for more than a few years has ever risen back above it.¹⁴

The culture of low fertility is evident not just in declining family size, but in the stunning rise in the share of women having no children at all. Among German women born in 1940, just 11 percent ended their childbearing years without offspring. That share rose to 18 percent for the 1955 birth cohort—and is estimated to reach between 23 percent and 25 percent for the 1965 cohort, whose fertile years are all but complete. Although the trend is most dramatic in Germany, the figures for Japan and a number of other European countries, including Austria, Italy, the Netherlands and the UK, are nearly as high. Even in the United States, the share of women having no children has risen from 10 to 16 percent.¹⁵

While current trends offer little reason to hope for a rebound in fertility—and some reason to fear a continued decline—demographers should nonetheless be humble. Fertility is difficult to predict, and no one can rule out the possibility that it will once again rise above today's low levels. To alter the demographic trajectory of the developed countries, however, the increases would have to be large and sustained. Even then, the positive impact would not register for decades to come.

In the near term, higher fertility can do nothing to alleviate the two fundamental challenges facing aging developed countries: rising old-age dependency burdens and more slowly growing or contracting working-age populations. After all, new children in modern societies generally take at least 20 years to become new workers. Even if

¹² *The Demographic Future of Europe: Facts, Figures, Policies* (Wiesbaden, Germany: Robert Bosch Foundation and Federal Institute for Population Research, November 2005).

¹³ Joshua Goldstein, Wolfgang Lutz, and Maria Rita Testa, "The Emergence of Sub-Replacement Family Size Ideals in Europe," *Population Research and Policy Review* 22, no. 5-6 (December 2003).

¹⁴ Wolfgang Lutz, Vegard Skirbekk, and Maria Rita Testa, "The Low Fertility Trap Hypothesis: Forces that May Lead to Further Postponement and Fewer Births in Europe," *Vienna Yearbook of Population Research* (2006).

¹⁵ Tomáš Sobotka, *Postponement of Childbearing and Low Fertility in Europe* (Amsterdam: Dutch University Press, 2004); Toshihiko Hara, "Childless Couples and Couples with One Child: Is the Two-Children Norm Weakening in Japan?" (paper presented at the 54th Annual Meeting of the Population Association of Japan, Tokyo, June 8-9, 2002).

fertility surged overnight, it would have no impact on the old-age dependency ratio or the size of the working-age population until the mid-2020s, and only a marginal impact until the mid-2030s. The age wave would still arrive in full force, straining government budgets and slowing economic growth, before higher fertility gradually began to turn the projections around. In the meanwhile, of course, societies would also have to pay the extra cost of raising and educating their larger rising generations.

In the longer term, higher fertility could indeed make an enormous difference. The increases, however, would have to be large to substantially alter the projections. They would also have to occur very soon to have much impact within our projection horizon. Even if fertility immediately rose to the replacement level in Western Europe, the old-age dependency ratio would continue to rise steadily through the late 2030s. In Japan, it would continue to rise through the late 2040s. (See Figure 2-1.) The ratio would never return to today's level, and in many countries it wouldn't drop back to its 2030 level until the 2060s or 2070s. Meanwhile, though total populations would stabilize, working-age populations would still decline over the projection period.

Figure 2-1: Developed-World Demographic Indicators: Constant Fertility vs. Instant Replacement Fertility Scenario

		Old-Age Dependency Ratio					Population Change	
							Working Age	Total
		2005	2020	2030	2040	2050	2005-50	2005-50
United States								
	Constant	21	27	35	36	37	28%	40%
	Instant Replacement	21	27	35	36	36	30%	42%
Other English-Speaking Countries								
	Constant	24	31	39	44	47	15%	8%
	Instant Replacement	24	31	38	42	42	20%	36%
Western Europe								
	Constant	29	36	45	55	59	-18%	-4%
	Instant Replacement	29	36	44	50	50	-3%	16%
Japan								
	Constant	32	51	56	70	81	-39%	-22%
	Instant Replacement	32	51	53	60	63	-21%	1%

Source: *World Population Prospects* (UN, 2007).

The reason for the very long turnaround is something called “demographic momentum.” For decades after fertility rates first fell beneath replacement in the developed world, populations continued to grow because the cohorts of women passing through the childbearing years were relatively large. This demographic momentum has been thrown into reverse. The cohorts of women passing through the childbearing years in today's low-fertility countries are now so small that even

much higher fertility rates would still leave populations aging and shrinking into the 2030s and 2040s. The developed countries have dug themselves a deep demographic hole, and even in the unlikely event of a fertility rebound it would take them more than half a century to dig themselves out.

Life Expectancy

As fertility rates have plunged in the developed world, life expectancy has soared. Until well into the nineteenth century, people in even the most advanced Western economies could on average expect to live a mere 40 years. By the beginning of the twentieth century, the average had reached 50 in the United States and parts of Europe. Today, life expectancy in the developed world ranges from 77 in the United States, which once led the pack but now lags behind, to 82 in Japan, which has skyrocketed to first place over the past few decades. Until the middle of the twentieth century, the rise in life expectancy was due primarily to reductions in mortality at younger ages, as improved nutrition and sanitation, followed by the development of vaccines and antibiotics, dramatically lowered the toll of infectious disease. More recently, reductions in mortality at older ages have played the dominant role, as modern medicine has begun to make inroads against the chronic diseases that afflict the middle aged and elderly.

Will life expectancy continue to increase in the future? Almost all demographers believe that it will, though there is considerable disagreement about how much. Indeed, the demographics profession is in the midst of a major reevaluation of the future prospects for longevity. Until recently, most demographers assumed that life expectancy in the developed world was approaching its limit and that there was little room for additional gains. Over the past decade and a half, however, the preponderance of expert opinion has shifted steadily toward greater optimism, in large part because so many prior predictions of a slowdown have turned out to be wrong. Most demographers now believe that there is still considerable room for life expectancy to rise—and a few even argue that the long-term historical rate of improvement will continue indefinitely.

Demographers who take a more pessimistic view argue that the changing profile of morbidity in modern societies makes reductions in mortality, and hence gains in life expectancy, increasingly difficult to achieve.¹⁶ The eradication of infectious diseases such as cholera and small pox was not only relatively easy once the cure was found, but generated huge gains in life expectancy because most of the people whose lives were saved were young. Increasingly, however, morbidity is concentrated among the old—and most deaths are due to chronic diseases, many of which are resistant to cure. Over time, according to the pessimists, the most slowly declining causes of death will become the most widespread, and the overall rate of mortality decline will necessarily decelerate. Some demographers also point to new health threats that could slow or even reverse progress in the future. While the developing world has its AIDS plague, the developed world, and particularly the United States, must cope with a growing epidemic of obesity.

¹⁶ Bruce A. Carnes and S. Jay Olshansky, "A Realist View of Aging, Mortality, and Future Longevity," *Population and Development Review* 33, no. 2 (June 2007).

More generally, pessimism about the future prospects for longevity reflects the assumption that there is a fixed limit to the maximum human life span. If this is so, improvements in life expectancy must slow and eventually cease as medical progress pushes more and more people up against the limit. In the jargon of demographers, the dynamic is known as the “rectangularization of the survival curve.” The conventional wisdom among biologists and health experts appears to lend some support to the “fixity thesis.” It is well known that many measures of human organ efficiency decline linearly after about age 30, regardless of an individual's general health. It also appears that human cells are preprogrammed to reproduce themselves with accumulating imperfections, perhaps because there is little evolutionary advantage to living much past middle age. It thus seems only natural to suppose that everyone's reserve physiological strength must eventually fall to a level where even a minor trauma or illness will become life-threatening. If fatal, we call this “dying of old age.”

Although these assumptions may seem reasonable, demographers are beginning to question them. Starting with the pioneering work by Ronald Lee and Lawrence Carter in the early 1990s, numerous studies have shown that the changing profile of morbidity has thus far done little to slow the overall rate of mortality decline, which has been remarkably constant in the United States and other developed countries over the past century.¹⁷ Apparently societies have been able to maintain steady progress because they respond to changing priorities, redirecting medical resources to combat newly dominant causes of death—and mobilizing public opinion against new health threats, as happened with smoking starting in the 1960s and is beginning to happen with obesity today. The emerging consensus in the profession is that long-term mortality projections should be based on long-term historical trends. At an October 30, 1997 conference of the Society of Actuaries, a gathering of prominent demographers, economists, and actuaries was surveyed on just this issue.¹⁸ Of the 59 respondents, more than three-quarters agreed that forecasts based on aggregate mortality data are more accurate than cause-specific forecasts—and two-thirds agreed that historical trends should be the “primary guide.”

At the same time, demographers are reconsidering the fixity thesis. Some reject it altogether, while others still believe that though in theory there may be a maximum limit to the human life span, we do not know the precise age at which it becomes of practical significance. The fact that people keep living longer, in other words, may simply mean that the limit is considerably higher than was once assumed. Indeed, if we were approaching the limit, we should be observing a number of predictable consequences. Mortality improvements for the oldest elderly age brackets should be slowing relative to those for younger elderly age brackets. Cross-country differences in life expectancy at older ages should also be narrowing as more and more people bump up against the limit.

¹⁷ Ronald D. Lee and Laurence R. Carter, “Modeling and Forecasting U.S. Mortality,” *Journal of the American Statistical Association* 87, no. 419 (September 1992); and Shripad Tuljapurkar, Nan Li, and Carl Boe, “A Universal Pattern of Mortality Decline in the G7 Countries,” *Nature*, June 15, 2000.

¹⁸ “Impact of Mortality Improvement on Social Security: Canada, Mexico, and the United States,” proceedings of an October 30, 1997, seminar of the Society of Actuaries summarized in the *North American Actuarial Journal* 2, no. 4 (October 1998).

None of this appears to be happening. Since 1950, as far back as we have comprehensive data for all developed countries, age-specific rates of mortality decline have shown no general tendency to slow, even at advanced ages.¹⁹ To be sure, there are some exceptions, including the much-remarked (and as yet not satisfactorily explained) slowdown in the rate of improvement in mortality among elderly women in the United States.²⁰ But after each dip, the pace of improvement has generally resumed, and it is now at or near a record high for every age bracket over 65 in almost every developed country. The developed world's survival curve is thus shifting toward older ages, not changing its overall shape. Since 1960, life expectancy at age 80 has increased as fast or faster than life expectancy at age 65 in every developed country.²¹

As for differences in elderly life expectancy, they are if anything widening. For most of the postwar era, the gap between the developed country with the highest and lowest life expectancy at age 65 held steady at about two years, defying expectations that it would narrow over time. The gap in life expectancy at age 80 meanwhile held steady at one year. Since the mid-1990s, moreover, both gaps have steadily widened as Japan, which has *both* the highest and the most rapidly rising elderly life expectancy, has pulled ever further ahead of the pack. Today the gap in life expectancy at age 65 is three years and the gap at age 80 is two years. Everywhere the elderly are living longer, but as yet there is no evidence that the distance between laggards and leaders is narrowing.

Surveying the evidence, some prominent demographers now believe that life expectancy may soon rise to levels that would have seemed like science fiction not so long ago. James Vaupel of the Max Planck Institute projects that life expectancy in the world's longest-lived country could easily reach the mid-90s by 2050.²² He bases his projection on an extrapolation of the historical trend in "world record" life expectancy, which has risen almost linearly by three months per year over the past century and a half. Kenneth Manton of Duke University, using a different methodology, arrives at an even more optimistic conclusion.²³ Looking beyond historical trends to potential changes in underlying risk factors, from diet and lifestyle to affluence and educational attainment, he concludes that a life expectancy of 100 is theoretically possible—even without major breakthroughs in biogenetics that slow the aging process itself.

Most projection-making agencies, including the UN, expect gains to be more modest. The UN projects that life expectancy in the developed world will on average rise from 79 in 2005 to 84 in 2050. In the United States, toward the low end of the

¹⁹ Human Mortality Database, University of California, Berkeley and Max Planck Institute for Demographic Research, <http://www.mortality.org/>.

²⁰ Alicia H. Munnell, Robert E. Hatch, and James G. Lee, "Why Is Life Expectancy So Low in the United States," Issue in Brief no. 21 (Chestnut Hill, MA: Center for Retirement Research at Boston College, August 2004).

²¹ OECD Health Data 2007 (Paris: OECD, 2007).

²² Jim Oeppen and James W. Vaupel, "Broken Limits to Life Expectancy," *Science* 296, no. 5570 (May 10, 2002).

²³ Kenneth G. Manton and Eric Stallard, "Medical Demography: Interaction of Disability Dynamics and Mortality," in *Demography of Aging*, eds. Linda G. Martin and Samuel H. Preston (Washington, DC: The National Academics Press, 1994).

spectrum, it would rise from 77 to 83. In Japan, at the high end, it would rise from 82 to 87. Although these gains are significant, the pace of improvement is nonetheless assumed to be slower than in the past. Over the past 50 years, life expectancy in the developed countries has on average increased by 2.3 years per decade. In no decade has it increased by less than 1.9 years. Yet according to the UN it will increase by just 1.2 years per decade over the next 50 years—half the historical pace.

Are the UN projections too conservative? Although it is too soon to tell, it is worth recalling that the history of life-expectancy projections is mostly a history of embarrassing underestimates. According to one review of the demographic literature, every estimate of maximum life expectancy made between 1928 and 1990 has already been exceeded—and on average within just five years of the forecast.²⁴ The UN itself has raised its estimates of future life expectancy for most developed countries in each successive revision of its long-term projections over the past decade. It is now projecting that the developed countries will attain life expectancies in 2050 that are on average two years higher than it was projecting as recently as 1996.

While some people may be agnostic about the benefits of higher fertility, no one wishes for shorter life expectancy. Aging societies will almost certainly continue to invest heavily in medical research into the diseases that afflict the elderly—and with the potential for medical progress so promising on many fronts, it would be imprudent to dismiss the possibility that life expectancy may rise well above the UN's current expectations. The more aggressive predictions of today's longevity optimists may never come to pass, but the upside risk is clearly greater than the downside.

Immigration

Of the three variables in the population projection puzzle, international migration is subject to the greatest uncertainty. In the near term, migration flows are highly volatile, even chaotic. Unexpected movements of refugees and asylum-seekers, not to mention the vagaries of the business cycle and geopolitical events, can all trigger dramatic year-to-year oscillations. In the long term, migration flows are in principle more amenable to projection. Looking back at history, migration experts have identified statistically robust relationships between migration flows and broader demographic and economic trends, from differential rates of population growth to changes in relative wage levels. Some are even looking at indicators, such as the size of the skills gap between migrants and native-born workers, that appear to predict swings in government policy between greater openness and greater restriction. These insights, however, have yet to be integrated into a usable projection model. As things stand, migration projections by the UN and other projection-making agencies remain almost entirely ad hoc and lacking in theory or method.²⁵

There have been two great waves of international migration during the modern era. The first culminated in the “Great Migration” of the mid-nineteenth to early twentieth centuries, when roughly 50 million Europeans left their homes for the

²⁴ Oeppen and Vaupel, *op. cit.*

²⁵ For a review of immigration projection practice, see Neil Howe and Richard Jackson, *Long-Term Immigration Projection Methods: Current Practice and How to Improve It* (Washington, DC: CSIS, June 2006).

New World. International migration then plunged, falling to historic lows between the 1930s and 1960s amid increasingly restrictive government policies. The second wave began to gather momentum in the 1970s and 1980s as government policies swung back toward greater openness. This time, of course, the mass movement of migrants has been predominantly from the developing to the developed world.

In most developed countries, including the United States, the absolute level of net immigration—that is, gross in-migration minus gross out-migration—is now at or near all-time historic highs. Indeed, in many countries the level has doubled (and in some cases more than doubled) over the past 10 years alone. Because fertility rates have fallen since the 1960s, international migration has become an increasingly important component of the population equation—and at the margin, sometimes the dominant component. On a yearly basis, net immigration now accounts for roughly two-fifths of total population growth in the United States and nearly nine-tenths in the European Union’s EU-15 countries.

The UN projections that we use in this study assume that the current wave of international migration will continue indefinitely, though levels of net immigration in most developed countries are expected to decline at least somewhat from their recent heights. In the major traditional immigration countries, the assumed declines are relatively small. In Australia, the UN’s long-term net immigration assumption is 84 percent of the 2000-2005 level, in the United States it is 85 percent, and in Canada it is 96 percent. In most European countries, the assumed declines are larger—and in a few like Spain, where net immigration has risen tenfold over the past decade, most of the recent surge is assumed to be transitory. Nonetheless, in virtually every country, the UN’s long-term net immigration assumption is still higher than the historical level in any five-year period prior to 1995. The only significant exceptions involve historical curiosities: France, where net immigration also exceeded the long-term assumption in the early 1960s during the repatriation of the Algerian *pieds noirs*, and Germany, where it did so between 1985 and 1995, during the run up to reunification and the subsequent repatriation of ethnic Germans from the former Warsaw Pact countries.

The assumption that net immigration will remain at relatively high levels seems plausible when one considers the powerful “push” and “pull” factors driving international migration.²⁶ The existence of large differentials in population growth rates and wages between the developed and developing worlds creates a powerful economic incentive to move from countries where labor is abundant and capital is scarce to countries where the opposite conditions exist. Even when employment opportunities are minimal, as is the case in many European countries, generous welfare states often act as “immigration magnets.” Some experts also stress the importance of immigrant networks in developed countries in perpetuating migration streams once they are set in motion. Relatives and friends help new immigrants find jobs and homes, reducing the costs and increasing the returns of migration. They also provide social and cultural support in an immigrant community with a familiar language, food, religion, and customs. Other experts stress the demand-side role of

²⁶ For a review of the theoretical and empirical literature on migration drivers, see Howe and Jackson, *op. cit.*

developed countries' "dual labor markets"—a primary sector characterized by high-wage jobs, high returns to human capital, and high job security and a secondary sector characterized by jobs with the opposite characteristics—in creating a built-in need for immigrant labor.

Yet if immigration pressure from younger and poorer developing countries now seems like an irresistible force, it may soon meet an immovable object in the rising tide of anti-immigrant sentiment in the developed countries. Opinion surveys consistently show that an overwhelming majority of the public believes that current levels of immigration are too high. According to a 2007 Pew poll, between 60 and 90 percent of the public in every major developed country save one favors stricter controls on immigration. The single exception is Japan, where the level of immigration, though rising, is still negligible.²⁷ The backlash has many causes. With income inequality growing in most developed countries, once-secure middle classes now feel increasingly vulnerable to competition from immigrants. There is also the widespread perception that today's migrants, especially Muslims in Europe and Hispanics in the United States, may be failing to assimilate. The fact that as much as a third of net immigration in Western Europe and the United States is illegal further fuels anti-immigrant sentiment.

Ironically, low fertility may itself help trigger public opposition. Many economists argue that below-replacement fertility is a compelling economic rationale for maintaining or increasing current levels of immigration, since migrants can help offset the deficit of native-born youth. Yet the scarcer native-born youth are, the more visible and politically contentious any given level of immigration becomes. In some large European and U.S. cities, over half of school-age children are now the sons and daughters of recent immigrants. In the UK, the second most common name for a newborn baby boy is now Mohammed; in Texas the most common name is José.²⁸

If immigration policies in most developed countries remain more liberal than the public wants, it is in large part because "client politics" has so far trumped "majoritarian politics." Most business lobbies strongly support more open immigration policies, since capital benefits from an influx of migrants. High-wage workers are also believed by economists to benefit from an influx of low-wage labor. For their part, mainstream politicians have been reluctant to endorse more restrictive policies, which have historically been championed by parties of the far right, from Austria's Freedom Party to France's National Front. Over the past few years, however, the scales have begun to tip the other way. Although a few countries, notably Australia, Canada, and Spain, are resisting the trend, government policy almost everywhere is swinging back toward greater restriction.

In Europe, mainstream parties in most countries are taking a harder line on illegal immigration—and in many they are debating and enacting tighter eligibility rules for legal immigrants under asylum and family reunification programs. Several

²⁷ *World Publics Welcome Global Trade: But Not Immigration* (Washington, DC: Pew Research Center, October 4, 2007).

²⁸ Helen Nugent and Nadia Menuhin, "Mohammad is No 2 in Boy's Names," *The Times*, June 6, 2007; and Popular Baby Names by State, U.S. Social Security Administration, <http://www.ssa.gov/OACT/babynames/namesbystate.html/>.

countries, including France and the Netherlands, now require immigrants to take language and cultural literacy tests. Several have also introduced genetic tests to establish family relationships. To be sure, many European governments are simultaneously moving to expand skilled immigration—and in 2007 the EU, amid much fanfare, announced a new “Blue Card” that establishes a fast-track visa process for highly skilled migrants. The vast majority of migrants to Europe, however, are unskilled and enter through the asylum and family reunification programs that governments are now beginning to squeeze. Meanwhile in the United States, efforts to fashion a grand compromise on immigration reform, which would have included both tighter border controls and a guest-worker program to regularize the status of illegal immigrants, have collapsed. At the time of this writing, all that remains is the plan to build a fence across large stretches of the U.S.- Mexican border.

If the current trend toward more restrictive policies gathers momentum, the UN’s assumptions may prove to be too high. At the very least, the swing of the policy pendulum suggests that large increases in immigration over today’s levels are unlikely in most countries. Still, it is worth considering whether stepped up immigration could substantially alter the demographic trajectory of the developed countries.

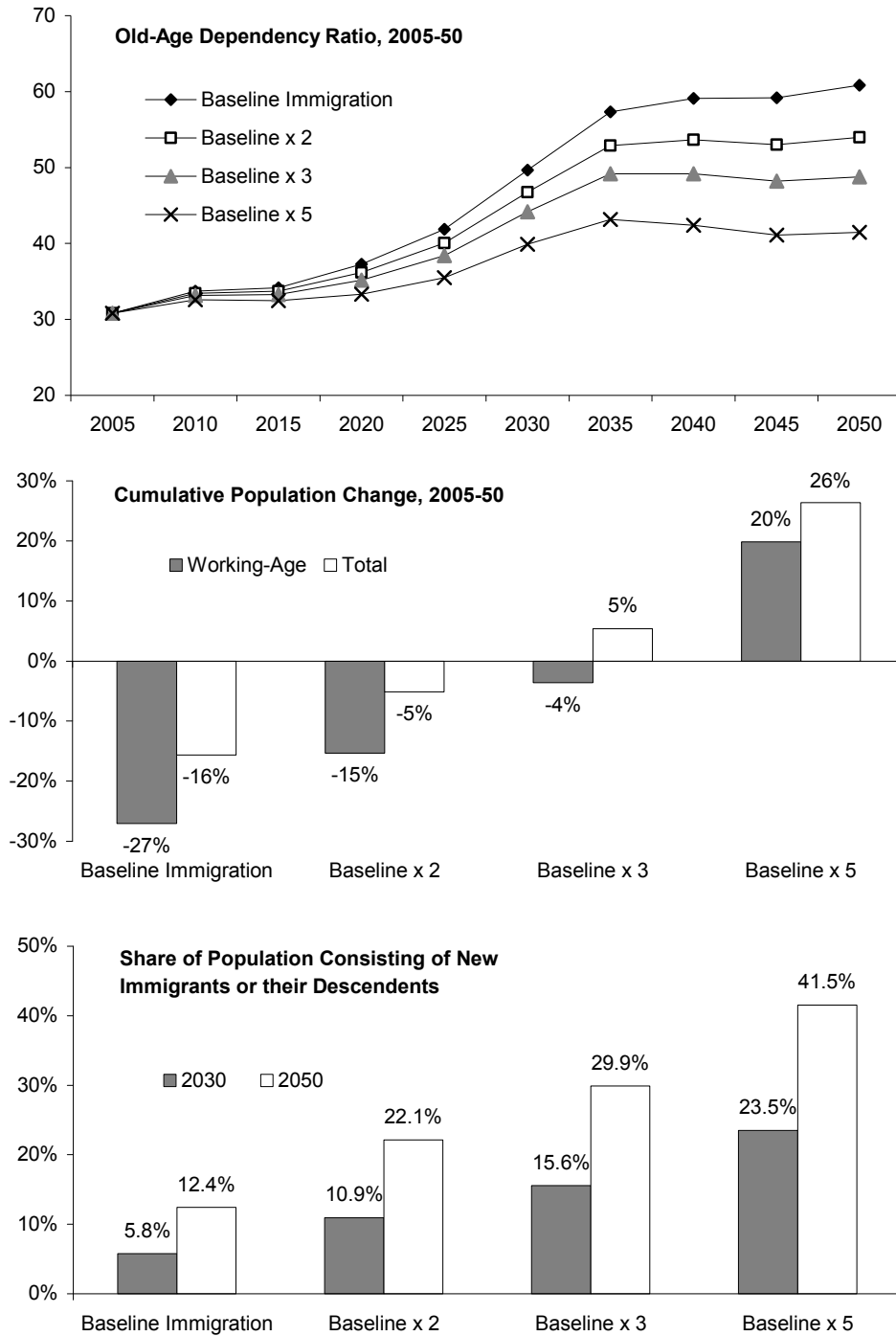
The answer is yes—but that it would require staggering increases. In most Northern European countries, the annual level of net immigration would have to permanently double over the UN’s assumptions to keep working-age populations from shrinking over the next half-century. In most of the fast-aging countries of Europe’s low-fertility zone, the deficit of native-born youth is so large that the annual level of net immigration would have to triple to keep working-age populations from shrinking. The increases required to stave off population aging would be even larger. Consider the case of Germany. If annual net immigration permanently tripled from 750,000 to 2,250,000, Germany’s old-age dependency ratio would still rise from 31 today to 44 in 2030 and 49 in 2050. Germany wouldn’t have solved its aging problem, but it would have dramatically altered the ethnic composition of its population. By 2050, 30 percent of Germans would be new immigrants or their descendants. (See Figure 2-2.)

None of this is to say that immigration cannot help aging developed countries cushion the impact of low fertility and ease emerging labor shortages. Those countries which continue to be successful at assimilating substantial migrant flows will enjoy an important relative advantage in confronting their age waves. Immigration is the main reason that the U.S. population is projected to grow rather than stagnate over the next half-century. It is also the reason that the demographic outlook in Canada remains relatively favorable, despite a European-level fertility rate of 1.5. What this analysis does suggest is that immigration has practical limits as an antidote to demographic aging.

THE IMPACT ON GOVERNMENT BUDGETS

Graying means paying—more for pensions, more for health care, more for long-term care for the frail elderly. As societies age, they must transfer a rising share of income from working adults to non-working elders, whether through families,

Figure 2-2: Alternative Immigration Scenarios in Germany



Source: Authors' calculations based on *World Population Prospects* (UN, 2007).

financial markets, or government budgets. Since most developed countries have largely socialized the cost of growing old, the lion's share of the extra burden will fall on governments and taxpayers.

To gauge the potential pressure on government budgets, we project the cost of public pensions and health benefits for the elderly under what we call a "current deal" scenario. For pensions, the projections assume that retirement ages remain unchanged in the future and that benefits continue to replace the same share of wages as they do today. For health benefits, they assume that the growth rate in (age-adjusted) per capita spending in each country will gradually converge to the rate of growth in per capita GDP plus 1 percent, which is roughly the historical average for the developed countries. The current deal scenario thus shows the cost of maintaining the overall level of generosity of old-age benefit systems that most societies now consider adequate and politically acceptable—or, to look at it another way, the magnitude of the adjustments that would be required to stabilize costs. Figure 2-3 summarizes the projection results for both pensions and health benefits.

Figure 2-3: CSIS "Current Deal" Projection: Government Old-Age Benefits, as a Percent of GDP, 2005-2050

	Public Pensions			Health Benefits			Total		
	2005	2030	2050	2005	2030	2050	2005	2030	2050
Developed World	7.7%	12.4%	15.1%	3.1%	6.0%	8.5%	10.9%	18.4%	23.6%
US	6.1%	10.4%	11.0%	3.2%	7.6%	10.4%	9.3%	17.9%	21.4%
Other English-Speaking Countries	5.4%	8.4%	10.0%	2.7%	5.4%	7.9%	8.1%	13.7%	17.9%
Canada	4.4%	8.3%	9.7%	3.1%	5.6%	6.9%	7.5%	13.9%	16.6%
UK	6.6%	9.4%	11.2%	2.7%	5.5%	8.7%	9.3%	14.9%	19.9%
Western Europe	10.6%	15.8%	20.0%	3.0%	5.1%	7.4%	13.6%	20.9%	27.5%
France	12.8%	19.0%	22.1%	3.5%	6.6%	9.4%	16.3%	25.7%	31.5%
Germany	11.7%	18.4%	22.6%	3.4%	4.8%	6.8%	15.1%	23.2%	29.3%
Italy	14.2%	19.3%	27.6%	2.8%	4.0%	6.0%	17.0%	23.2%	33.6%
Japan	8.7%	14.3%	20.2%	3.4%	4.4%	6.0%	12.0%	18.6%	26.2%

Source: Authors' calculations. See "CSIS Current Deal Projection" in Appendix 1.

The cost of maintaining today's deal would be staggering indeed. In Japan, public pension spending would have to rise from 8.7 percent of GDP in 2005 to 14.3 percent by 2030 and 20.2 percent by 2050. The projections for Western Europe vary greatly from country to country, depending on the severity of the aging trend and the generosity of the public pension system. In Europe's largest economies, however, where benefit levels are unusually high and retirement ages unusually low, the burden would rival or even exceed that in Japan. The projections for the United States and the other English-speaking countries are less daunting, both because their

demographics are relatively more favorable and because their public pension systems are less generous. But even here, public pension spending would have to rise steeply—nearly doubling in the United States, from 6.1 percent of GDP in 2005 to 10.4 percent in 2030 and 11.0 percent in 2050. Almost everywhere, costs would ramp up steeply in the 2010s and 2020s, then continue to rise more slowly in the 2030s and 2040s.

Health-care spending on the elderly will also be a large and growing burden. Not only is the overall number of elderly increasing relative to the number of young, but on average each elder consumes at least three times more health care than each younger adult.²⁹ Moreover, rates of health-care consumption rise rapidly even among the elderly themselves—and it is the oldest elderly age brackets that will be the fastest growing of all, a phenomenon demographers call the “aging of the aged.” While the number of elderly aged 65 to 79 in the developed world is projected to grow by 57 percent between 2005 and 2050, the number of “old old” aged 80 and over is projected to grow by 173 percent.

The interaction of these multipliers could be explosive. We project that government health-care spending on the elderly would double as a share of GDP in most countries by 2030 and triple by 2050. Once again the averages conceal a wide range of outcomes—but here it is the United States that faces the largest future burden. Between 2005 and 2050, government health-care spending on the elderly would rise from 3.2 percent to 10.4 percent of GDP, a larger increase than in any other country. Indeed, so large is the extra burden that it would offset much of the relative advantage the United States enjoys in pensions.

Adding together pensions and health care, we project that the total cost of today’s deal would eventually rise to at least 15 percent of GDP in every developed country except Australia, Ireland, and the Netherlands. In many countries, including the United States, the cost would exceed 20 percent of GDP—and in a few, including France, Germany, and Italy, it would approach or exceed 30 percent of GDP. On average, the developed countries today spend 10.9 percent of GDP on public pensions and health benefits for the elderly. By 2030, they would be spending 18.4 percent of GDP; by 2050, they would be spending 23.6 percent. To put these projections in perspective, just the average increase in spending—roughly 13 percent of GDP by 2050—is about three times what the United States now spends on national defense. It is also in most countries the equivalent of at least 25 percent of workers’ taxable wages.

The late Herb Stein, the former chairman of the U.S. Council of Economic Advisers, is reputed to have said that things that are unsustainable tend to stop. Clearly, the cost of today’s deal will eventually be reduced. The size of the required adjustments, however, is enormous—and the political resistance from electorates increasingly dominated by elderly voters is likely to be intense. Figure 2-4 shows the reductions in benefit levels or increases in retirement ages that would be required to stabilize pension costs as a share of GDP and workers’ wages in different countries. The benefit reductions range from 36 percent to 60 percent and the retirement age hikes from 6 to 11 years.

²⁹ Unpublished data from the OECD Economics Department.

Figure 2-4: Retirement-Age Increase or Per Capita Benefit Reduction Required to Stabilize Government Pension Spending as a Share of GDP

	Benefit Reduction		Retirement-Age Increase	
	2005-30	2005-50	2005-30	2005-50
Australia	40%	50%	6	10
Belgium	32%	42%	4	8
Canada	47%	55%	7	10
France	33%	42%	5	8
Germany	36%	48%	4	9
Italy	26%	49%	4	10
Japan	39%	57%	8	11
Netherlands	43%	48%	7	10
Spain	28%	60%	5	11
Sweden	29%	36%	4	6
UK	30%	41%	4	7
US	41%	44%	5	7

Source: Authors' calculations. See "CSIS Current Deal Projection" in Appendix 1.

While the United States has yet to take significant steps to reduce the future old-age dependency burden, a number of developed countries have. The UK led the way in the early 1980s when it began indexing public pensions to prices rather than wages. More recently, many other European countries have also modified pension indexing formulas—and a few, including Germany, Italy, and Sweden, have introduced “demographic stabilizers” that directly adjust benefit levels to offset rising dependency ratios. According to the European Commission, these reforms would eventually reduce per capita benefits relative to per capita wages by as much as 20 to 30 percent in several countries, including France, Germany, Italy, and Sweden.³⁰ Japan has also introduced a demographic stabilizer that would reduce benefits by a similar amount.

It is unclear, however, how much of the savings will actually materialize. Most of it is long deferred. Few governments, moreover, have clearly announced the magnitude of the scheduled benefit cuts to the public—and the elderly in most countries are highly dependent on government benefits. Even in the United States, with its vaunted traditions of limited government, its large private pension system, and its relatively high rates of elderly labor-force participation, 54 percent of the income of the typical elderly household comes in the form of a government check. In every other major developed country, with the exception of Canada and Japan, the share is at least 70 percent. In France, public benefits account for 78 percent of the income of the typical elderly household, in Italy 83 percent, and in Germany 84 percent.³¹ (See Figure 2-5.)

³⁰ “The Impact of Aging on Public Expenditure: Projections for the EU25 Member States on Pensions, Health Care, Long-Term Care, Education and Unemployment Transfers (2004-2050),” *European Economy*, Special Reports, no 1/2006 (Brussels: European Commission, 2006), 78.

³¹ *The 2003 Aging Vulnerability Index: An Assessment of the Capacity of Twelve Developed Countries to Meet the Aging Challenge* (Washington, DC: CSIS and Watson Wyatt Worldwide; 2003), 38.

Figure 2-5: Government Cash Benefits in 2000, as a Percent of the After-Tax Income of Households Aged 60 & Over

	Average	Third Quintile
Australia	43.4%	81.6%
Belgium	54.7%	75.0%
Canada	42.2%	62.0%
France	67.3%	78.2%
Germany	61.4%	84.3%
Italy	58.8%	82.7%
Japan	34.9%	NA
Netherlands	54.0%	74.2%
Spain	64.0%	76.7%
Sweden	56.5%	70.2%
UK	50.3%	74.8%
US	34.9%	54.2%

Source: Richard Jackson and Neil Howe, *The 2003 Aging Vulnerability Index: An Assessment of the Capacity of Twelve Developed Countries to Meet the Aging Challenge* (Washington, DC: CSIS and Watson Wyatt Worldwide, 2003).

If private retirement savings were growing fast enough to fill the gap as public benefits are cut, the recent reforms would be more sustainable. Few countries, however, are making much progress on this front. To be sure, a few, including Germany, Italy, and Spain, are trying to launch new private pension systems. But participation in the systems remains very low, in part because of governments' reluctance to be forthright about the size of the future cuts in public pension benefits embedded in recent reforms. Meanwhile, rates of pension coverage are flat or declining in most countries that already have sizeable private systems—the case in Canada, Japan, the UK, and the United States. In fact, in the entire developed world, only Australia, which recently established a large, universal, and fully portable private pension system that will mature over the next few decades, is now on track to significantly reduce the reliance of retirees on government benefits.

Will the squeeze on elderly income trigger a political backlash that forces governments to roll back scheduled benefit cuts? While it is impossible to know for sure, the experience of the UK may be a harbinger of things to come. For years following its early 1980s reform, the UK was widely regarded as the only developed country to have solved the long-term problem of rising old-age benefit costs. But as price indexing caused public pension benefits to decline steadily as a share of wages—and, contrary to initial hopes, as private retirement savings failed to fill the gap—the voices calling for repeal of the reform grew louder. In 2007, amid an emerging consensus that current policy would impoverish the elderly, the government reindexed benefits to wages.

The alternative to reducing benefit levels is to raise retirement ages, and in recent years many developed countries have begun to take steps here as well. Several

European countries are raising eligibility ages under special early retirement programs that were put in place in the 1970s and 1980s. Many countries, including the United States, have also scheduled modest increases in the so-called normal retirement age—that is, the age at which full benefits are available under the regular public pension system. According to the European Commission, the cumulative impact of reforms to date will gradually raise the average age of retirement in Europe by one year, from 62 to 63.³² When it is fully phased in by mid-2020s, the increase in the U.S. normal retirement age is also expected to raise the average retirement age by about one year—from 64 to 65.

The reforms passed to date fall far short of what is required to keep the public pension burden from growing rapidly. To stabilize pension costs as a share of GDP, the average retirement age in the United States would have to rise by five years by 2030 and by seven years by 2050—and this assumes that longer contribution histories are not compensated with higher annual benefits, as they would be under current law. In Germany, the average retirement age would have to rise by nine years by 2050, and in Japan it would have to rise by eleven years. Adjustments of this size are not inconceivable. In some countries, retirement ages have fallen nearly as far over the past half-century as they would have to rise over the next. But they would require vast changes in public pension systems, labor markets, and personal life plans—and go far beyond anything being debated by developed-country governments.

Reducing elderly health benefit costs may prove as difficult as reducing pension costs. To borrow a phrase from U.S. health-care expert Henry Aaron, the “painful prescription” is that effective cost control requires the rationing of potentially beneficial medical services.³³ Although there is clearly much waste in most developed-country health-care systems, and eliminating it might realize a large one-time savings, it is not the proliferation of waste that is causing health-care costs to rise faster than GDP. It is the continuous introduction of expensive new medical tests and treatments that are of at least some marginal benefit. Although most national health systems already ration access to medical technology, reducing future cost growth beneath the historical trend will require stricter limits. The problem is that social expectations, fueled by rising affluence, educational attainment, and the public’s greater access to information about medical advances, are pushing in precisely the opposite direction.

Some argue that improvements in the health of the elderly will reduce future cost growth. As evidence, they point to the fact that rates of disability, as measured by limitations on “activities of daily living” like bathing, dressing, and cooking, have fallen dramatically among the elderly in the United States and a number of other developed countries over the past 25 years.³⁴ While this is a positive trend, it does

³² Giuseppe Carone, “Long-Term Labor Force Projections for the 25 EU Member States: A Set of Data for Assessing the Economic Impact of Aging,” *European Economy*, Economic Papers, no. 235 (Brussels: European Commission, November 2005), 31.

³³ Henry Aaron and William Schwartz, *The Painful Prescription: Rationing Hospital Care* (Washington, DC: Brookings Institution Press, 1984).

³⁴ Vincent Mor, “The Compression of Morbidity Hypothesis: A Review of Research and Prospects for the Future,” *Journal of the American Geriatrics Society* 53, no. 9, Suppl. 1 (September 2005).

not follow that future cost growth will slow. For one thing, the trend may not continue unless the recent rise in obesity among younger adults is reversed. For another, less disability is not the same thing as less morbidity. Even as the share of elderly with activity limitations has fallen, the share with expensive chronic conditions, from diabetes and hypertension to Alzheimer's and heart disease, has been constant or rising.³⁵ If falling disability did portend slower future cost growth, we might expect it to have reduced past cost growth as well. But this has not happened. Indeed, looking at the historical record, one can easily imagine a causal relationship between changes in disability and health-care costs that is precisely the reverse of what the optimists assume. Perhaps the consumption of a high and rising volume of health-care services is the very reason that the elderly are becoming less disabled.

Whatever happens to acute-care spending on doctors and hospitals, it is likely that the demand for long-term care will rise at least as fast as the number of old old. That demand, after all, is highly sensitive to socio-demographic factors that are independent of trends in disability, especially the number of family caregivers available to help each dependent elder. Most elders in the developed world today have several surviving children. But when today's midlife adults grow old in their turn, they will be much more likely to have only one child or no children—or to be never-married, widowed, or divorced. Only a few developed countries, all of them in Scandinavia, have fully socialized the cost of caring for the frail elderly. Elsewhere, families still play a crucial role. As they come under increasing pressure, more of the care they now provide informally may be shifted to government budgets. Although we have not factored this development into our projections, it could become yet another multiplier on the old-age dependency burden.

To the extent that governments fail to stabilize old-age benefit spending, they will have to finance the extra burden. Yet few developed countries are in a position to raise taxes enough to pay for the full cost of their age waves—and some have little or no room to raise taxes at all. Many developed countries are already at or beyond what economists call the threshold of efficient taxation, meaning that, rather than raise new revenue, higher tax rates may simply cause workers to work fewer hours, increase unemployment, or drive labor into a growing gray economy. This is particularly true in the European Union, where the total tax burden in the EU-15 countries now averages 46 percent of GDP. Indeed, the high tax burden in Europe is already reducing work effort and tax revenues. According to economist Edward C. Prescott, differences in tax burdens explain much of the divergence in hours worked between the United States and Europe.³⁶ Ominously, it is usually those countries that face the largest future spending burdens that already have the highest tax rates. And even in relatively low-tax countries like the United States, where there appears to be more fiscal room to accommodate rising old-age benefit costs, other pressing priorities, such as extending health-care coverage to the growing numbers of uninsured, may preempt new tax revenues.

³⁵ Eileen Crimmins, "Trends in the Health of the Elderly," *Annual Review of Public Health* 25 (2004).

³⁶ Edward C. Prescott, "Why Do Americans Work So Much More Than Europeans?" *Federal Reserve Bank of Minneapolis Quarterly Review* 28, no. 1 (July 2004).

The developed countries thus find themselves confronting a challenge with no easy solutions. Faced with a choice between politically impossible benefit cuts and economically ruinous tax hikes, many may instead choose to accommodate the growth in old-age benefit spending by cannibalizing other functions of government, such as education, infrastructure, and national defense. Either that, or they may run widening fiscal deficits that undermine national savings and economic growth.

THE IMPACT ON EMPLOYMENT AND GDP

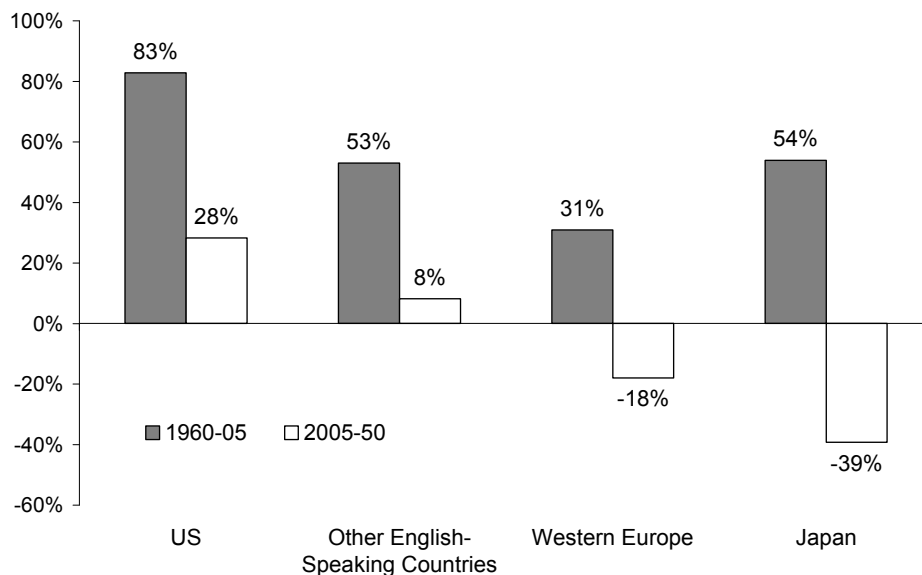
Over the postwar era, employment growth has been a major and sometimes the dominant contributor to economic growth in the developed countries. Between 1960 and 2005, it has accounted for 18 percent of GDP growth in Japan and Western Europe, 36 percent in the other English-speaking countries, and 51 percent in the United States. If there had been no employment growth in the United States since 1960, the economy in 2005 would have been less than half the size it actually was.

Yet in the future, employment will contribute little to GDP growth in most developed countries—and in many, it will actually subtract from growth. The result could be an unprecedented secular economic slowdown that leaves some of today's largest developed countries barely expanding from one generation to the next.

Historically, the growth in employment was of course fueled by the expansion of working-age populations. That expansion, however, is now ending and in most countries will soon be thrown into reverse. In Japan, the working-age population grew by 54 percent between 1960 and 2005 but will contract by 39 percent between 2005 and 2050. In Western Europe, it grew by 31 percent but will contract by 18 percent, with much larger declines in Germany, Italy, and the other countries of Europe's low-fertility zone. The outlook for the United States and the rest of the English-speaking world is more favorable. But even here there will be a dramatic slowdown. While the U.S. working-age population grew by 83 percent between 1960 and 2005, it will grow by just 28 percent between 2005 and 2050—only one-third as much. (See Figure 2-6.)

Employment has also been given a big boost by the mass entry of women into the labor market. But here too, the contribution to growth is waning as rates of female labor-force participation in many countries approach those for men. In the United States, the female labor-force participation rate has risen from 43 percent to 72 percent since 1960, and now stands at 84 percent of the rate for men. In France, it is now 86 percent of the rate for men, in Canada 88 percent, and in Sweden 93 percent. In all of these countries, and indeed throughout most of Northern Europe and the English-speaking world, the share of women who work rose rapidly from the 1960s to the 1980s, but has since grown more slowly or plateaued. In Japan and some of Europe's more traditional societies, including Ireland, Italy, and Spain, female labor-force participation rates began to rise later and continue to lag well behind men's. Yet even in these countries, the female participation rate is at least two-thirds of the rate for men, meaning that most of the potential gains in employment have already occurred.

Figure 2-6: Cumulative Percentage Change in the Working-Age Population (Aged 20-64), by Region and Time Period



Source: *World Population Prospects* (UN, 2007).

Figure 2-7 presents several illustrative projections of GDP growth in the developed countries between now and 2050. The baseline scenario assumes that labor-force participation rates remain unchanged in the future, except to allow for a cohort effect in female labor-force participation. The effect takes into account the fact that, in countries where labor-force participation rates have recently risen among women in younger age brackets, rates in older age brackets are also likely to rise with a lag as these younger women age into them. There are also “higher retirement age,” “higher female labor-force participation,” and “lower productivity” scenarios—as well as, for purposes of comparison, a purely hypothetical “historical employment growth” scenario in which employment in each country is assumed to grow at its average rate over the past 45 years. All of the scenarios, except the lower productivity scenario, assume that productivity increases at 1.5 percent per year, roughly the developed-country average over the past quarter-century. This stylized assumption allows us to isolate the impact of demographic trends.

The results are sobering. In the baseline scenario, slower (or negative) employment growth would reduce GDP growth by one percentage point by the 2020s in Western Europe and the other English-speaking countries. The near-term decline is smaller in Japan because of the strong cohort effect in female labor-force participation. By the 2030s, however, GDP growth in Japan would fall by a full percentage point as well, dropping to near zero. Even in the United States, GDP growth would decline by half a percentage point. Over the next 45 years, the U.S. economy would expand by just 154 percent, compared with 253 percent if employment were to grow at the rate it has over the past 45 years. The slowdown is

Figure 2-7: Illustrative GDP Projection Scenarios, 2005-2050

	Average Annual Growth Rate in Real GDP					GDP Index (2005=100)	
	2005-10	2010-20	2020-30	2030-40	2040-50	2030	2050
United States							
Baseline Scenario	2.5%	2.1%	2.0%	2.1%	2.0%	169	254
Higher Retirement Age	2.7%	2.3%	2.2%	2.1%	2.1%	180	270
Higher Female LFP	2.7%	2.4%	2.2%	2.1%	2.0%	180	271
Lower Productivity	2.0%	1.6%	1.5%	1.6%	1.5%	149	203
Historical Employment Growth Scenario	3.2%	3.2%	3.2%	3.2%	3.2%	220	353
Other English-Speaking Countries							
Baseline Scenario	2.4%	1.9%	1.6%	1.6%	1.5%	160	218
Higher Retirement Age	2.5%	2.1%	1.9%	1.6%	1.6%	171	232
Higher Female LFP	2.4%	2.1%	1.8%	1.6%	1.5%	165	224
Lower Productivity	1.9%	1.4%	1.1%	1.1%	1.0%	141	174
Historical Employment Growth Scenario	2.6%	2.6%	2.6%	2.6%	2.6%	189	277
Japan							
Baseline Scenario	1.3%	1.1%	1.0%	0.4%	0.2%	131	140
Higher Retirement Age	1.4%	1.3%	1.1%	0.5%	0.2%	138	145
Higher Female LFP	1.7%	1.5%	1.4%	0.3%	0.2%	145	153
Lower Productivity	0.8%	0.6%	0.5%	-0.1%	-0.3%	116	112
Historical Employment Growth Scenario	2.3%	2.3%	2.3%	2.3%	2.3%	177	250
Western Europe							
Baseline Scenario	1.9%	1.4%	0.9%	0.9%	1.0%	138	166
Higher Retirement Age	2.1%	1.6%	1.3%	0.9%	1.1%	151	180
Higher Female LFP	1.9%	1.5%	1.2%	0.9%	1.0%	143	172
Lower Productivity	1.4%	0.9%	0.4%	0.4%	0.5%	122	133
Historical Employment Growth Scenario	2.0%	2.0%	2.0%	2.0%	2.0%	165	224

Source: Authors' calculations. See "Developed-Country GDP Scenarios" in Appendix 1.

more pronounced in Western Europe and Japan, whose economies would expand by just 66 and 40 percent. While the U.S. economy has doubled in size over the past 22 years, it would take another 33 years for it to double again. In Western Europe, it would take another 64 years for the economy to double in size—and in Japan, it would take an incredible 168 years.

The coming slowdown in employment and GDP growth is an inescapable consequence of population aging and population decline. While behavioral and policy responses might mitigate the slowdown, they would have to be large to substantially improve the outlook—and even in a highly optimistic scenario, the developed countries would almost certainly face a future of slower economic growth.

The most obvious response is higher retirement ages. While the rise in female labor-force participation has caused total employment to grow faster than the working-age population over the past half-century, the trend toward earlier retirement has pushed the other way. It is possible that retirement ages will once again rise if employers respond to emerging labor shortages by bidding up the wages of older workers. At least in the United States, survey evidence also suggests that attitudes toward retirement are changing among today's middle-age adults—and that the majority intend to work longer than their parents.³⁷ In most countries, however, large changes in retirement behavior would require large changes in public policies that now subsidize early retirement—or to look at it the other way around, that penalize continued work at older ages. According to the OECD, workers in some European countries lose nearly as much in lifetime pension benefits by continuing to work past age 60 as they gain in lifetime earnings.³⁸

To gauge the potential impact of higher retirement ages, we consider a scenario in which the average retirement age gradually rises by five years in every country—a large increase by any standard. The projections assume that all new older workers will be employed full time and that, on average, they will be just as productive as the average worker—both of which are highly optimistic assumptions. The largest impact would be in Western Europe, where GDP would be 8 percent larger in 2050 than under our baseline projection. In the United States GDP would be 6 percent larger and in Japan 4 percent larger. Although these gains are significant, GDP would still grow much less over the next 45 years than it has over the past 45.

Another possible response is higher female labor-force participation. Although our baseline projection allows for a cohort effect that boosts female labor-force participation well above today's levels in most countries, it is possible that the share of women who work might rise even further if changes in public policies and cultural norms make it easier for them to balance jobs and family. Here we consider an extreme scenario in which the female labor-force participation rate in all countries rises to 95 percent of the rate for men. Complete parity is clearly unattainable, since some women, no matter how supportive the workplace or family environment, will always choose to remain full-time homemakers—and indeed, a 95 percent ratio of female to male labor-force participation is higher than the ratio in any country today except Finland. This time the largest impact would be in Japan, whose GDP would be 9 percent larger in 2050 than under our baseline. In the United States GDP would be 7 percent larger and in Western Europe 4 percent larger. Once again,

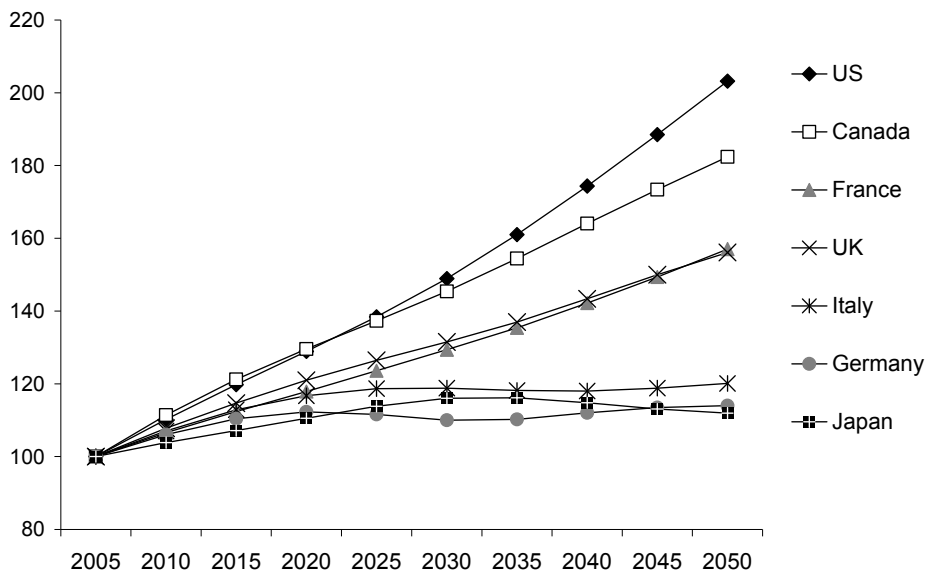
³⁷ Ruth Helman, Craig Copeland, and Jack VanDerhei, "Will More of Us Be Working Forever?: The 2006 Retirement Confidence Survey," Issue Brief no. 292 (Washington, DC: Employee Benefit Research Institute, April 2006).

³⁸ Romani Duval, "The Retirement Effects of Old-Age Pension and Early Retirement Schemes in OECD Countries," OECD Economics Department Working Papers no. 370 (Paris: OECD, November 2003).

these gains are significant. Yet once again, they fall far short of raising GDP growth back to historical norms.

Other behavioral and policy shifts might help as well. People who are already in the labor force, for instance, might work longer hours. Realistically, however, there is probably little room to pursue this strategy in countries like the United States and Japan, which are already famous for their long work weeks and short vacations. And though there is in theory much room to raise hours worked in most Western European countries, doing so would require lowering tax burdens—as well as negotiating changes in the social contract that would be every bit as contentious as raising retirement ages. The fierce resistance that has greeted recent attempts to increase France’s legally mandated 35-hour workweek is a case in point. Even if countries are successful, moreover, the productivity of each extra hour worked will likely be less than the productivity of the average hour worked, which means that gains will not translate proportionally into higher GDP.

**Figure 2-8: Lower Productivity Scenario for the G-7:
Growth in Real GDP by Country, 2005-2050 (Index: 2005=100)**



Source: Authors' calculations. See "Developed-Country GDP Scenarios" in Appendix 1.

This brings us to the final and most crucial variable in the projections—the future trend in productivity, or growth in output per worker. A large and sustained surge in productivity growth could go a long way toward boosting GDP growth in the developed countries back toward historical norms. The problem, as we will see in the next chapter, is that demographic trends will be pushing the other way—toward lower, not higher productivity growth. In the coming decades, aging developed countries will have to cope with falling rates of savings and investment,

not to mention the economic fallout from the mounting fiscal burden of supporting burgeoning elderly populations. In the end, they may be fortunate to achieve the 1.5 percent historical productivity growth rate assumed in our projections. If productivity growth were to fall by just one-third to 1.0 percent, real GDP growth in Japan, Germany, and other fast-aging European countries would come to a complete standstill by the 2020s. (See Figure 2-8.)

THE DEVELOPED WORLD: ASSESSING THE CONSEQUENCES

Demographic aging will profoundly affect the geopolitical stature of the developed countries—and challenge, in numerous ways, their ability to maintain national and global security. The consequences can be usefully divided into three main types.

First, there is the impact of demographic aging on the relative size of countries in future decades—that is, their size relative to other countries or to what it would be without aging. As we have seen, the fertility decline associated with demographic aging will lead to sharp reductions in future population growth and in many cases to outright population decline, especially among the nonelderly. Numbers per se have always been considered an important indicator of geopolitical strength—via the potential size of armed forces, ability to occupy territory, the size of the economy, and efficiencies of scale.

Second, there is the impact of aging on the structure and performance of the economy. Here the focus is not on the static first-order impact on sheer numbers (whether of service- and working-age people or of dependents), but on the dynamic second-order effects of demographic aging. How will critical measures of economic performance, such as productivity growth, be affected by the sectoral and workforce shifts triggered by demographic aging? How will they be affected by changes in rates of savings and investment or by the resulting shifts in global capital flows? What about the impact of more slowly growing (or contracting) markets on business psychology?

Third, there is the impact of demographic aging on social mood. This is the least explored dynamic, yet it may prove to be the most consequential. How will older age structures affect risk-taking, time horizons, and the overall tone of the culture? How will the changing shape of the family affect personality and willingness to serve? How will the rising average age of electorates affect voting and political decision-making? And what about immigration, which itself is often directly associated with demographic aging? Will changing ethnic composition affect levels of social trust and civic cohesion in the developed countries—and perhaps even their geopolitical orientation?

The chapter considers the consequences of demographic aging in each of these areas in turn.

CHANGES IN DEMOGRAPHIC SIZE

The association between population size and the power and prestige of states has been recognized throughout history. In the ancient world, it was taken for granted. From Pericles to Augustus, nearly every leader looked with favor on any measure that could encourage the population of the state—and therefore its strength and glory—to rise. In early modern Europe, as we have seen, kings and their mercantilist advisors began to translate this “populationism” into an explicit doctrine.

The importance of population size for geopolitical stature is also a universal theme in the classics of modern national security literature. Although one is not justified in considering a country to be very powerful because its population is greater than that of most other countries, it is still true, in the words of Hans Morgenthau, that “no country can remain or become a first-rate power which does not belong to the more populous nations of the earth.”¹ According to A. F. Kenneth Organski, “Population size is the most important determinant of national power. With it, a lack of other determinants of power can be overcome. Without it, great power status is impossible.”² Hedley Bull, another renowned international relations scholar, also insists on the importance of population: “A population of 100 million or more today is not sufficient to confer superpower status upon a nation, but it is widely thought to be necessary for this status.”³

Two major advantages of sheer size are mentioned again and again in this literature: greater numbers of young adults able to serve in war and occupy territory and a larger economy able to equip and supply the military, enhance national prestige, and sway the policy choices of neighbors and adversaries. There is a further advantage of sheer size that has been helpful to empires since ancient times and has been widely recognized by economists since Adam Smith: efficiencies of scale.

Size of Population

Population size influences a nation’s geopolitical stature by determining (at least in part) its ability to defend or aggress against others in time of war. This is so because the “effective” size of a population (those of an age able to serve) constitutes the limit to mobilization. In times of total war, authoritarian governments often push their mobilization right up to this limit, as Germany and the Soviet Union did during World War II. Even democratic governments sometimes do the same. By the end of World War I, 79 percent of all Frenchmen between the ages of 15 and 49 had seen military service.⁴ Even short of total war, a country with a larger population will be able to marshal a larger force with less social effort and less relative economic cost.

According to most philosophers, statesmen, and military strategists across the ages, the size of a military force has usually served an important if not critical role in

¹ Hans J. Morgenthau, *Politics Among Nations* (New York: Knopf, 1948), 91.

² A. F. Kenneth Organski, *World Politics* (New York: Knopf, 1958), 198.

³ Hedley Bull, “Population and the Present World Structure,” in *Population in an Interacting World*, ed. William Alonso (Cambridge, MA: Harvard University Press, 1987), 79.

⁴ Mark D. Van Ells, *To Hear Only Thunder Again: America’s World War II Veterans Come Home* (Lanham, MD: Lexington Books, 2001).

assuring victory—both in the battle and in the war. As Clausewitz observed, “This [the superiority of numbers] is in tactics, as well as in strategy, the most general principle of victory.”⁵ Or as Voltaire famously put it, “God is always on the side of the big battalions.” Clearly, it is no accident that victorious leaders from Cyrus the Great and Caesar to Wellington and Eisenhower took such efforts to amass the largest forces they could muster. Yes, quality matters as much as quantity. But as Joseph Stalin is alleged to have remarked (regarding troops and tank production), “Quantity sometimes has a quality all its own.” To be sure, we know of many great commanders—from the Roman general Luculus to Frederick the Great and Stonewall Jackson—who excelled at defeating forces larger than their own. Yet this very ability is what makes them “great,” that is, exceptional.

Over time, it makes a difference if the population of a nation (or group of nations) is not growing while that of its potential adversaries is. And over decades, even small differences in growth rates can have dramatic consequences. During the 45 years prior to World War II, the U.S. population grew from 70 million to 133 million, or by 1.4 percent per year. By 1940, it was nearly as large (93 percent) as the population of Germany and Japan combined. (See Figure 3-1.) Now consider a what-if scenario. If the U.S. population during the 45 years prior to the war had grown at the rate that it is projected to grow over the next 45 years—0.7 percent per year—it would have been 98 million in 1940. If it had grown, or rather contracted, at the rate that Western Europe’s population is projected to over the next 45 years, it would have been 67 million—and if it had contracted at the rate that Japan’s is projected to, it would have been 54 million, just two-fifths the size it actually was. With such a small population, the United States could not possibly have fielded the force that it did, a total of 12.4 million men under arms at the peak of wartime mobilization. With a combined population 2.6 times that of the United States, Germany and Japan would have enjoyed an overwhelming numerical advantage.

It is sometimes said that population matters less to success in war today than in the past, and that an advantage in technology now easily eclipses an advantage in numbers. In the age of mass conscription and industrialized warfare that began with the French Revolution and Napoleonic Wars and lasted through World War II, superior population may indeed have given nations a decisive edge in war. But spectacular advances in military technology are now ushering in a new age in which relatively small numbers of highly trained and high-tech-equipped soldiers suffice to dominate much larger but less well-equipped forces.

While there is some truth to this objection, the ascendancy of technology over manpower is hardly absolute. For every good example (the 1991 victory of the higher-tech U.S.-led coalition over lower-tech Iraq) there is a counter example (the 1975 victory of lower-tech North Vietnam over the higher-tech United States). The competition between sheer numbers and superior technology and organization is almost as old as warfare itself, and the balance has see-sawed back and forth throughout history without any clear unilinear trend. There are examples of overwhelming victories by smaller and better-equipped and organized armies in

⁵ Quoted in John Saunders, “Introduction: Population and Security,” in *Population Change and European Security*, eds. Lawrence Freedman and John Saunders (London: Brassey’s, 1991), 1.

Figure 3-1: U.S. Population in 1940 Compared with Population of Germany and Japan: History vs. Hypothetical Scenarios

History		(Population in Millions)
69.9	U.S. population in 1895	
132.6	U.S. population in 1940	
142.8	Combined population of Germany and Japan in 1940	
Hypothetical		
97.6	U.S. population in 1940...	If 1895-1940 growth rate had equaled U.S. growth rate for 2005-2050
67.1	U.S. population in 1940...	If 1895-1940 growth rate had equaled Western European growth rate for 2005-2050
54.3	U.S. population in 1940...	If 1895-1940 growth rate had equaled Japanese growth rate for 2005-2050

Source: Authors' calculations based on historical data from Angus Maddison, *World Population, GDP and Per Capita GDP, 1-2003 AD*, August 2007, <http://www.ggd.net/maddison/>; and *World Population Prospects* (UN, 2007).

modern times (the 1967 victory of Israel over the Arab League), but there were also such examples in antiquity (the 490 B.C. victory of the Athenian hoplites over the Persians at the Battle of Marathon).

The advantages that superior technology confers, moreover, are never permanent. On the one hand, potential adversaries can copy and catch up—or else adjust their strategy or tactics in ways that nullify the edge. On the other hand, in an era of rapid technological change, weapons in which dominant powers have heavily invested can be rendered suddenly obsolete by new technologies pioneered by rising powers, as happened to the battleship after the Battle of the Coral Sea. As military historian Max Boot warns, “Because creativity is so unpredictable, no country can count on making all, or even most, major scientific and technological breakthroughs. Moreover, few if any technologies, much less scientific concepts, will remain the property of one country for long.... It is a truism that new technology, if it proves effective, tends to disseminate quickly.”⁶ This suggests that today’s technologically dominant developed countries might be best served by a future in which the pace of technological change slows down.

Another objection is that total or large-scale war (in which population limits on force size matter most) is no longer a serious risk, and is unlikely to become one again in the future. This is of course a risky bet. Because such wars have always been infrequent, it is difficult to argue that the experience of the past few decades offers any great degree of reassurance. Moreover, even smaller wars may require lots of manpower—perhaps not to ensure victory in battle, but to follow through successfully with occupation, pacification, and nation-building. The recent experience

⁶ Max Boot, *War Made New: Technology, Warfare, and the Course of History: 1500 to Today* (New York: Gotham Books, 2006), 458.

of the United States in Iraq and Afghanistan, where mere occupations tax total U.S. preparedness, is a case in point. While the Iraq War offers many lessons for U.S. policymakers and military strategists, perhaps the most important is that “boots on the ground” still matter.

Insurgencies led by stateless leaders are also discovering new “asymmetric” strategies and tactics, from suicide bombers to hijacked jetliners laden with fuel, that may more than compensate for any advantage the developed countries possess in organization and technology. Asymmetric warfare has of course been around at least since Napoleon fought the original “guerillas” in Spain at the beginning of the nineteenth century. But it appears to be becoming more effective over time—in part because today’s insurgents have access to sophisticated technologies (“improvised explosive devices,” or IEDs, for example), in part because, as historian Niall Ferguson argues, democratic governments in today’s developed countries often lack the “staying power” required to suppress insurgencies and are constrained by humanitarian norms that limit the ruthlessness of their response.⁷ According to military scholars Jason Lyall and Isaiah Wilson III, the probability of a great power winning an asymmetrical war has fallen steadily, from over 90 percent during the 1851-1875 period to just under 25 percent during the 1976-2001 period.⁸

While one can debate what the manpower needs of militaries will be a few decades hence, there is little question that manpower will be in scarcer supply in most developed countries. It is not just that populations will be growing more slowly or contracting throughout the developed world. Prime recruitment-age populations (aged 17 to 24) will be growing even more slowly (or contracting even more rapidly) than total populations or overall working-age populations. (See Figure 3-2.) Indeed, the United States is the only major developed country that will experience any growth in its prime recruitment-age population over the next half-century.

The effective size of recruitment pools, moreover, is likely to be even smaller than the overall trend in youth numbers suggests. In an era of zero-growth workforces, competition between the military and civilian sectors over recruitment-age youth will intensify.⁹ Furthermore, rural populations will be hollowing out more rapidly than urban populations—and in virtually every developed-country military, it is rural youth who are the most likely to enlist (in the U.S. Army, 50 percent more likely than urban youth in 2005).¹⁰ At the same time, with militaries requiring more skilled soldiers, the share of youth (rural or urban) who qualify for service is declining. Already in the United States, seven out of ten 17 to 24 year-olds are

⁷ Niall Ferguson, “Cowboys and Indians,” *The New York Times*, May 24, 2005. See also Niall Ferguson, *Colossus: The Rise and Fall of the American Empire* (New York: Penguin Books, 2004).

⁸ Jason Lyall and Isaiah Wilson III, “Rage Against the Machines: Explaining Outcomes in Counterinsurgency Wars” (unpublished paper, March 10, 2008). The paper updates an earlier version presented at the Center for International Security Studies (CISSM) Forum, University of Maryland, May 10, 2007.

⁹ See Rickard Sandell “Coping with Demography in NATO Europe: Military Recruitment in Times of Population Decline,” in *Service to Country*, eds. Curtis Gilroy and Cindy Williams (Cambridge, MA: The MIT Press, 2006), 85.

¹⁰ U.S. Department of Defense data tabulated by The National Priorities Project, <http://www.nationalpriorities.org/>.

Figure 3-2: Cumulative Percentage Change in the Population of the G-7 Countries, Total and by Age Group, 2005-2050

	Total Population	Working Age (Age 20-64)	Recruitment Age (Age 17-24)
Canada	28%	12%	-2%
France	13%	0%	-1%
Germany	-16%	-27%	-36%
Italy	-14%	-29%	-31%
Japan	-22%	-39%	-47%
UK	8%	-1%	-11%
US	40%	28%	24%

Source: *World Population Prospects* (UN, 2007).

ineligible because of obesity, medical conditions such as asthma or diabetes, drug dependency or failed drug testing, the existence of young dependents, or prior criminal records.¹¹

To be sure, it may be possible to supplement scarce youth by recruiting soldiers at older ages and by retaining soldiers in the military longer. The U.S. military is already raising recruitment age limits—and is also debating how its time-honored “up or out” promotion system might be modified to encourage longer careers. Some experts even argue that an older and more experienced military might be an advantage in some types of missions, from complex special operations to training and advising friendly forces. Everyone acknowledges, however, that there are limits to this strategy. The number of adults in their 30s or 40s who are both physically qualified and interested in enlisting is relatively small. And while an older force structure may have certain advantages, it is difficult to replace the vigor of youth in combat.

Militaries can of course minimize their need for recruits and maximize their combat capacity by hiring civilians to substitute for military personnel in noncombat functions. The United States is now outsourcing logistical support of all kinds on an unprecedented scale, thus increasing the “tooth to tail” ratio of its fighting forces.

It is also possible to get around the need to “grow your own military” by substituting nonnative for native manpower. Historically, the search for what geostrategist Thomas Barnett calls “body shops” has taken many forms—from hiring mercenaries to recruiting special contingents of foreign troops (such as the French Foreign Legion and the Gurkha regiments of the British military) to relying on local allies for personnel-intensive missions (a common strategy of both imperial Rome and Britain).¹² The United States is now in effect making extensive use of mercenaries, commonly known as “private security contractors,” many of whom are foreign. It is also encouraging immigrants to serve in the military. Since 9/11, the United States has offered an expedited path to citizenship to legal permanent residents who enlist. Max Boot and Michael O’Hanlon argue that it could instantly

¹¹ Barbara A. Bicksler and Lisa G. Nolan, “Recruiting an All-Volunteer Force: The Need for Sustained Investment in Recruiting Resources,” *Policy Perspectives* 1, no. 1 (September 2006).

¹² Thomas Barnett (Enterra Solutions), interview by authors, December 13, 2006.

fill its future recruitment needs by actively recruiting *potential* immigrants abroad. As they note, “Despite growing anti-Americanism, U.S. citizenship is still one of the world’s most precious commodities....”¹³

Although all of these strategies will have to be exploited by the developed countries, their limitations need to be acknowledged. It is difficult to impose military discipline on private security forces, as the recent Blackwater USA affair in Iraq has underscored. To the extent that they are recruited domestically, moreover, it is hard to see how, in the long run, they help close the underlying demographic deficit. Mercenaries fight for pay, which will always raise questions about their loyalty, while the forces of local allies may or may not be reliable. Even immigrants, if recruited in large numbers, might pose problems for force cohesion. Before the developed countries delink the manning of the military from the core civic motivation of service to country, they would do well to recall the lessons of history. From the ancient world to early modern Europe, governments that have farmed out their national defense often ended up losing control of their armies, their foreign policies, and even their countries. Starting with Gibbon, many historians have noted that Rome began to decline the moment it could no longer find enough citizens who believed it was their duty to defend it.

The security consequences of trends in aggregate population size are not limited to the impact on military recruitment and prowess in war. Sheer numbers also matter in peacetime, since the people of one ethnic group or nation can assume cultural, economic, and ultimately political power by outgrowing another. This can happen due to the changing demographic fortunes of two groups within a state, or to population-driven migration between states—the inevitable tendency of growing societies to overflow across the borders of shrinking societies. The shrinking society may invite the newcomers, or it may feel powerless to resist. In any case, the newcomers can profoundly reshape the host society. As Samuel Huntington observes, “The juxtaposition of a rapidly growing people of one culture and a slowly growing or stagnant people of another culture generates pressures for economic and/or political adjustments in both societies.”¹⁴ We return to this issue later in the report.

Size of Economy

If population enhances national power due to its impact on the sheer number of potential soldiers and citizens, it does so even more due to its impact on economic production. More workers translate directly and proportionally—assuming no change in the growth trend in product per worker—into more GDP. In scholarship on war and foreign policy, size of economy ranks alongside size of population as a standard determinant of national power, and is cited by every classic text, from Morgenthau and Organski to Quincy Wright. Paul Kennedy, in *The Rise and Fall of the Great Powers*, concludes that one of history’s great lessons is that a rising nation’s military and political power always follows its growth in material and productive

¹³ Max Boot and Michael O’Hanlon, “A Military Path to Citizenship,” *The Washington Post*, October 19, 2006.

¹⁴ Samuel Huntington, *The Clash of Civilizations and the Remaking of World Order* (New York: Simon & Schuster, 1996), 119.

power.¹⁵ When historians explain the outcome of wars—from the U.S. or English Civil Wars to World Wars I and II—no explanation is more standard than to emphasize the decisive impact of economic superiority over other factors, such as military experience and tactics.

To be sure, these and other historians often focus on how factors other than mere population can affect economic size. Paul Kennedy wanted to explain why economic strength causes nations to rise, while “imperial overstretch,” by weakening the economy, ultimately leads nations to fall. John Brewer, in his now-classic *Sinews of Power*, wanted to explain how a demographically small nation (England) could build a mighty world empire on the strength of its economy.¹⁶ Yet no one disputes that population size and economic size together are a powerful double engine of national power.

Empirical studies of war outcomes support this conclusion. In a study of 39 major international wars between 1815 and 1945, military scholar Steven Rosen found that 31 (80 percent) were won by the wealthier party—and that the importance of wealth in determining the outcome rose in the biggest wars. Wealth even dominated willingness to sacrifice (as measured by the casualty ratio), which one might expect would be a critical factor.¹⁷ Other scholars have come to similar conclusions. Summarizing the evidence, Frank W. Wayman, J. David Singer, and Gary Goertz write: “In war, it is advantageous to have an overall superiority in industrial and demographic as well as military terms.... In militarized disputes [short of war], we again find that industrial and urban capabilities are associated with prevailing....”¹⁸

Once again, over time, it makes a difference if the economy of a nation (or group of nations) is not growing while that of its potential adversaries is. And over decades, even small differences in growth rates can have dramatic consequences. Let’s return to our what-if scenario—only this time, let’s look at GDP. During the 45 years prior to World War II, the size of the U.S. economy grew (in 1990 purchasing power parity dollars) from \$255 to \$930 billion, or by 2.9 percent per year. While our population was nearly equal to Germany’s and Japan’s combined in 1940, our GDP was 58 percent larger. (See Figure 3-3.) If U.S. GDP during the 45 years prior to the war had instead grown at the rate that it is projected to grow over the next 45 years in the projection scenario we introduced in the last chapter—2.1 percent per year—it would have been \$646 billion in 1940.¹⁹ If it had

¹⁵ Paul Kennedy, *The Rise and Fall of the Great Powers: Economic Change and Military Conflict from 1500 to 2000* (New York: Random House, 1987).

¹⁶ John Brewer, *Sinews of Power: War, Money, and the English State, 1688-1783* (Cambridge, MA: Harvard University Press, 1990).

¹⁷ Steven Rosen, “War Power and the Willingness to Suffer,” in *Peace, War and Numbers*, ed. Bruce M. Russett (Beverly Hills, CA: Sage, 1972).

¹⁸ See summary in Frank W. Wayman, J. David Singer, and Gary Goertz, “Capabilities, Allocations, and Success in Militarized Disputes and Wars, 1816-1976,” *International Studies Quarterly* 27, no. 4 (December 1983), 510.

¹⁹ This projection scenario assumes a future growth rate in real GDP per worker of 1.5 percent per year, which is virtually identical to the historical growth rate in GDP per worker between 1895 and 1940. Thus, the differences in GDP outcomes are due almost entirely to the slower projected growth of total population, and to the fall in the ratio of employed persons to population, over the projection period.

Figure 3-3: U.S. GDP in 1940 Compared with GDP of Germany and Japan: History vs. Hypothetical Scenarios

History		(GDP in Billions of 1990 PPP Dollars)
\$254.6	U.S. GDP in 1895	
\$929.7	U.S. GDP in 1940	
\$587.0	Combined GDP of Germany and Japan in 1940	
Hypothetical		
\$646.0	U.S. GDP in 1940...	If 1895-1940 growth rate had equaled U.S. growth rate for 2005-2050
\$423.7	U.S. GDP in 1940...	If 1895-1940 growth rate had equaled Western European growth rate for 2005-2050
\$356.0	U.S. GDP in 1940...	If 1895-1940 growth rate had equaled Japanese growth rate for 2005-2050

Source: Authors' calculations based on historical data from Angus Maddison, *World Population, GDP and Per Capita GDP, 1-2003 AD*, August 2007, <http://www.ggd.net/maddison/>; and CSIS projections. See "Developed-Country GDP Scenarios" in Appendix 1.

grown at the rate that Western Europe's GDP is projected to grow, it would have been \$424 billion—and if it had grown at the rate that Japan's is projected to grow, it would have been \$356 billion, just 38 percent as large as it actually was in 1940 and just 61 percent as large as the combined GDP of Germany and Japan. The United States would have been a much less formidable "arsenal of democracy," if indeed it could have been the arsenal of democracy at all.

GDP can enhance national influence in a variety of ways—through business dominance, leverage with NGOs and philanthropies, social envy and emulation, and cultural clout in the media and popular culture. Political scientist Joseph Nye Jr. would call much of this "soft power"—and admittedly, soft power can be important.²⁰ Yet clearly, one crucial way that GDP enhances national influence is by allowing more spending on the "hard power" of national defense and the "semi-hard power" of global assistance.

The problem is that hard power must be paid for through the public sector—and if there is one thing that we have already learned about the public sector in the developed world, it is that it will be under relentless pressure from the rising cost of pensions and health benefits for retirees. In every major developed country, the projected growth in old-age benefits over the next few decades dwarfs current defense budgets. (See Figure 3-4.) As their economies grow more slowly in the future (and in some cases, stagnate or even contract), will the developed countries be willing to raise taxes enough to both pay for their aging populations and to maintain current levels of defense spending? If they have reached their tax efficiency threshold, as many European countries have, will they even have that option? Or is it more likely that they will cut defense spending?

²⁰ Joseph S. Nye Jr., *Soft Power: The Means to Success in World Politics* (New York: Public Affairs, 2004).

Figure 3-4: Spending on National Defense in the G-7 Countries in 2005, as a Percent of GDP, Compared with Projected Growth in Government Old-Age Benefits from 2005 to 2050

	National Defense	Government Old-Age Benefits	
	2005	2005-30	2005-50
Canada	1.1%	6.4%	9.1%
France	2.5%	9.4%	15.2%
Germany	1.4%	8.1%	14.2%
Italy	1.8%	6.2%	16.7%
Japan	1.0%	6.6%	14.2%
UK	2.3%	5.6%	10.5%
US	4.0%	8.6%	12.1%

Source: For defense, International Institute for Strategic Studies, *The Military Balance* (London: Routledge, 2007); and for old-age benefits, authors' calculations. See "CSIS Current Deal Projection" in Appendix 1.

To be sure, the danger of crowding out may be less in the United States than in most other countries. Its relatively small public sector and current low tax burden will give it more fiscal room to accommodate rising old-age benefit expenditures, while relatively faster growth in its workforce and GDP will make any given spending burden more affordable. Yet even in the United States, the fiscal squeeze will be intense. As a share of GDP, the projected *growth* in old-age benefits between 2005 and 2030 will be more than double everything it now spends on national defense.

As time goes by, the fiscal squeeze will make it progressively more difficult to pursue the obvious (if problematic) response to manpower shortages—investing massively in military technology, and thereby substituting capital for labor. The United States, which in 2004 accounted for an estimated 45 percent of total world defense spending but nearly 75 percent of total world spending on defense R&D, is currently seeking new and better ways to accomplish this.²¹ Stealth warships, predator drones, robotic mules and assault vehicles, loitering attack missiles, total digital integration of fire and sensor systems—the list of dazzling new military technologies goes on and on. Nor is it just new and more expensive weapons systems, but new and more expensive training for the servicemen and women who use them. There is no question that the accelerating trend toward capital substitution can help leverage scarce manpower. The question is: Will an aging United States—and developed world—be able to afford it?

Efficiencies of Scale

Ever since ancient times, demographic and economic size has derived its importance not just from its role in helping states deter potential enemies or undertake successful conquests, but from the efficiencies of scale that it allows.

²¹ Keith Hartley, "Defense Economics," in *The New Palgrave Dictionary of Economics*, 2nd ed., eds. Steven N. Durlauf and Lawrence E. Blume (New York: Palgrave Macmillan, 2008), *The New Palgrave Dictionary of Economics Online*, Palgrave Macmillan, <http://www.dictionaryofeconomics.com/>.

Many ancient empires achieved large gains in agricultural output per farmer by investing in vast irrigation systems that would not have been cost-effective with smaller populations or a smaller number of acres under cultivation. In the early modern era, mercantilist writers, in their advice to monarchs seeking to expand their power, stressed the importance of large-scale commerce and industry in increasing the treasure of the state. In 1776, Adam Smith explained how efficiencies of scale also applied to the decentralized economy. The “extent of the market” within a nation, he wrote, directly contributed to the wealth of nations by extending the division of labor and increasing the number of people trading and competing with each other, thus raising output per worker.²² Most of the classical political economists concurred that efficiencies (or “economies”) of scale offer large potential benefits to society. Most modern economists concur as well.

To be sure, not all economic activities become more efficient as the size of a nation’s population and economy increases. The optimal scale of a firm is often smaller than the limits placed on it by the size of its relevant market—which, in today’s global economy, is itself often not limited to a single nation. Almost all economists, however, stress that there are many important (often quasi-public) undertakings whose optimal scale, for reasons of geography and politics, is the nation state. To take a few U.S. examples, consider what the Hoover Dam, the interstate highway system, and the postal service all have in common. In every case, the operating cost per unit of output (or per citizen) declines as the size of the population and economy increases. A static population or economy would put an end to these “increasing returns to scale,” and a shrinking population or economy would throw them into reverse. Thus more growth helps, and less growth hurts.

Many of the twentieth century’s most distinguished economists have stressed the contribution of efficiencies of scale to economic growth. Edward F. Denison, the pioneer of growth accounting, calculated that 18 percent of the total growth in U.S. national income from 1929 to 1982 was attributable to efficiencies of scale—nearly as large a share as he calculated was attributable to capital.²³ Colin Clark and Nicholas Kaldor have found evidence in support of Verdoorn’s Law (named after the Dutch economist Petrus Johannes Verdoorn), according to which there is a fixed positive relationship between the growth rate of GDP and productivity growth that is independent of the technological progress that may be associated with higher output.²⁴ Surveying the evidence, Geoffrey McNicoll concludes that, “Empirically, population size appears to have a modest but distinctly positive effect on economic growth....”²⁵

Some economists also believe that population size and growth, beyond fostering efficiencies of scale, also stimulates innovations in technology and economic

²² Adam Smith, *An Inquiry into the Nature and Causes of the Wealth of Nations* (1776).

²³ Edward F. Denison, *Trends in American Economic Growth, 1929-1982* (Washington, DC: Brookings Institution, 1985).

²⁴ See Colin Clark, *The Conditions of Economic Progress*, 3rd ed. (London: MacMillan, 1957); Nicholas Kaldor, *Causes of the Slow Rate of Economic Growth of the United Kingdom* (Cambridge: Cambridge University Press, 1966); and Nicholas Kaldor, “Economic Growth and the Verdoorn Law: A Comment on Mr. Rowthorn’s Article,” *The Economic Journal* 85, no. 340 (December 1975).

²⁵ Geoffrey McNicoll, “Population Weights in the International Order” *Population and Development Review* 25, no. 3 (September 1999), 426.

organization. Ester Boserup and Colin Clark argue that growing population density encourages people to innovate and thus gives rise to new and more efficient means of production—a classic example being the shift from traditional slash-and-burn agriculture to more productive and sustainable methods of cultivation.²⁶ Simon Kuznets and Julian Simon additionally argue that large populations, because they have a larger pool of human ingenuity, are likely to produce more new ideas.²⁷

There is also, of course, a dissenting tradition in modern economics that emphasizes “decreasing returns to scale.” The most obvious examples involve natural resources and the environment. Per unit of output, it is cheaper to grow less food with the same available land, to pump less oil from the same reservoir, or to emit less pollution into the same air and water. Humanity’s number and appetites can grow without limit, but the earth’s carrying capacity cannot. That is why, as economist E.F. Schumacher famously put it, “Small is beautiful.”²⁸ Although the case for no-growth or slow-growth may have some merit, it must be qualified with serious caveats. Many of the natural resource arguments only make sense from a global perspective, since the cost of food, oil, and most other commodities is determined internationally. Indeed, the slower growth of a particular economy may do nothing to save on resources or help the environment if other economies grow faster as a result—for example, if lower energy prices caused by slower growth in Europe encourage Asia to grow faster with less regard for the environment.

Whatever one makes of these pro- and anti-growth arguments, no one disputes that there are certain collective activities where increasing returns to scale may be decisive. Nowhere is this truer than in national defense, since the enemy is of fixed size. It is easy to forget that the triumph of the nation state as a form of political organization was driven by its demonstrated superiority in war against all competitors, including the feudal regimes and city-states that it supplanted. The history of national governments, which have always ratcheted up their relative size in times of war, is testimony to the singular importance of economies of scale in producing security in a dangerous world.

CHANGES IN ECONOMIC PERFORMANCE

Up to now, we have been dealing with questions of size and scale—and with the geopolitical implications of smaller populations and smaller economies in the developed world over the coming decades. These are the first-order consequences of demographic aging. We turn now to questions of structure and process—all of the ways in which an economy, independent of its absolute size, is affected over

²⁶ See discussion in Geoffrey McNicoll, “Consequences of Rapid Population Growth: An Overview and Assessment,” *Population and Development Review* 10, no. 2 (June 1984).

²⁷ See Julian Simon, *The Ultimate Resource* (Princeton, NJ: Princeton University Press, 1977); Simon Kuznets, “Population Change and Aggregate Output,” in *Demographic and Economic Change in Developed Countries*, ed. National Bureau of Economic Research (Princeton, NJ: Princeton University Press, 1960).

²⁸ Ernst F. Schumacher, *Small is Beautiful: A Study of Economics As If People Mattered* (London: Blond & Briggs, 1973).

time by the aging of its consumers and workers and by the slowing of its overall rate of growth. We might call these the second-order consequences of demographic aging, and they are attracting much attention these days among economists.

We organize the discussion in this section under five headings: economic structure, rates of savings and investment, global capital flows, workforce aging, and market psychology. In all of these areas, the shift toward older age structures and slower population growth has the potential to impair economic performance. In general, the impacts can be expected to be more pronounced in Europe and Japan, where demographic aging is the most severe and economies are less flexible. Economic performance in the United States, however, may also be adversely affected, and in one area—dependence on foreign capital—its economy is especially vulnerable to demographic aging.

Economic Structure

Demographic aging will trigger three broad structural shifts in the economy. First, as populations grow more slowly or contract, rates of consumption will rise and rates of investment will fall. Second, as populations age, the ratio of producers to non-producers will decline. And third, overall consumption will shift increasingly from the types of goods and services consumed by the young to the types consumed by the old. All of these shifts have potentially important (though sometimes offsetting) implications for productivity and for living standard growth.

Let's start with the rise in the consumption rate—or equivalently, the fall in the investment rate. In a growing population, each new child needs to be raised and educated and each new worker needs to be trained and equipped. In a static or contracting population, there will be less need (or perhaps no need) for what economists call “capital-broadening” investment. Society can spend relatively less on schools, on new production facilities and office space, on housing for young families, and on all types of public and private infrastructure, from transportation networks to shopping malls. Nor is it just a matter of less investment-related spending. Society will also see a reduction in the investment-related time (which, economists tell us, always has an opportunity cost) required to care for babies, to teach children, and to train and mentor young workers.

Many of these shifts are highly visible—and are already underway in most of the developed world. Domestic investment has fallen as a share of GDP in most developed countries over the past few decades, starting with those whose birthrates retreated first and fastest. In the United States, with its higher fertility and faster-growing population, the investment rate remains as high as ever. In fast-aging countries like Germany, Italy, and Japan, obstetric wards are being closed, schools shuttered, factories idled, and entire towns abandoned. At the same time, we have seen the emergence of a new lifestyle among young-adult singles who celebrate partying, clubbing, and travelling. Everywhere, societies are coining new words for young adults who cannot, or do not want to, start their own family and set up their own household: *twixters* in the United States, *boomerang kids* in Australia, *kippers* in the UK, *mammoni* in Italy, *nesthocker* in Germany, and *freeters* in Japan.

The extent of the shift from investment to consumption will depend on the degree of aging, the sectoral make-up of the economy, and the culture and

institutions of each developed country. Also, and importantly, countries may choose to redirect some of their new consumable income and free time into more care per child, more schooling per student, or more training or technology per worker—what economists call “capital-deepening” investment. Already, we see some evidence of this happening. Either way—by consuming more, by investing more per person (which boosts productivity), or, most likely, by doing some of both—standards of living will rise. With slower population growth, current generations are freed from some of the cost of capital broadening that burdened prior generations.

Is there any downside if investment rates decline as population growth slows? According to the standard neoclassical model, there isn’t. With the workforce growing more slowly (or not at all), less needs to be added to the economy’s capital stock to sustain the same capital-to-labor ratio—which is in theory the ultimate determinant of labor productivity and living standard growth. Yet many economists point out that a lower investment rate will cause the average age of the capital stock to rise, and it may be unrealistic to ignore this “vintage effect.” If high rates of innovation imply high rates of depreciation, then slower population growth may not relieve the economy of the necessity of new investment. Other economists suggest, more broadly, that the rate of innovation directly depends upon the rate or amount of investment. According to the so-called endogenous growth school,²⁹ productivity breakthroughs result from the “learning by doing” that happens when producers are constantly trying to expand capacity and overcome new bottlenecks. Less investment means less learning by doing, and thus less productivity improvement over time.

Now let’s turn to the second structural shift—the falling ratio of producers to non-producers in the population. In an aging society, all of us, on average, can consume a greater share of everything that is produced, and this raises living standards. A smaller share of us, however, will have to do all of the producing, and this pushes the other way. The working-age share of the population is now peaking and will soon be declining in all of the developed countries, including the United States. Consumption may rise as a share of national product as societies age, but to the extent that consumption is limited by production, consumption per capita will grow more slowly.

Much of the task of transferring income from workers who produce to retirees who do not is handled through pay-as-you-go entitlement programs, which as we have seen are an enormous public-sector fixture in virtually every developed country. To the extent that governments raise taxes to pay for the projected growth in old-age benefits, it will lower workers’ after-tax living standards. It will do so directly, by increasing the share of income that is taxed and transferred to retirees, and indirectly, by discouraging job creation and work effort, thus lowering the growth trend in income itself. The alternative to raising taxes—deficit financing—merely shifts the living standard penalty, through lower national savings, to younger and future generations. At the same time, working-age adults will be facing a rising transfer burden within families in the form of personal care for the disabled and frail elderly. This too will translate into a loss of time or income, or both.

²⁹ For the classic formulation of the endogenous growth argument, see Kenneth J. Arrow, “The Economic Implications of Learning by Doing,” *The Review of Economic Studies* 29, no. 3 (June 1962); and Paul M. Romer, “Increasing Returns and Long-Run Growth,” *The Journal of Political Economy* 94, no. 5 (October 1986).

To be sure, the rising old-age dependency burden will, to some extent, be offset by falling youth dependency. But since developed-country governments have socialized the cost of old-age dependency to a much greater extent than the cost of youth dependency, the offset is relatively small. In the United States, per capita federal benefits to the elderly tower 7-to-1 over per capita benefits to children.³⁰ It is also worth noting that the negative impact of rising elder-related spending typically follows the positive impact of falling youth-related spending with a lag of several decades. The developed countries have already experienced most of the savings, while most of the extra cost still lies ahead.

The third structural shift involves the tilt of overall consumption away from the needs and tastes of younger age groups to the needs and tastes of older age groups. Already in 1929, economist Lionel Robbins, contemplating the consequences of declining birthrates in the UK, observed that an aging economy means “fewer toys, and more foot-warmers.”³¹ Goods and services consumed by children and young families will decline in relative importance, while those consumed by the elderly will rise. Throughout the economy, the typical consumer will be older and perhaps less alert, less agile, or less active. Many aging experts specialize in forecasting product shifts: Everything from softer seats on subways and larger public signs to levers instead of knobs and ramps instead of stairs.

Associated with this shift in consumption from young to old will almost certainly be a shift away from products toward services—or rather, an acceleration in the ongoing shift that has characterized the developed economies in recent decades. A large share of what young households buy tends to be products: houses, cars, consumer durables, and food for growing families. A much larger share of what older households buy tends to be services: acute and long-term health services most of all, but also personal services of all kinds—for travel, leisure, media, and home maintenance and improvement.

The shift toward services will have several consequences, some good and others not so good. On the positive side, service industries require no inventories, which will make recessions less likely. On the negative side, inflation will be more difficult to measure and gains in output per worker more difficult to achieve. The latter problem—the resistance of services to productivity improvements—is known as “Baumol’s cost disease,” after the economist William J. Baumol who first wrote about it in the 1960s.³² In recent years, as advances in IT have revolutionized everything from business administration to marketing and customer service, Baumol’s cost disease has become less of a concern. Yet it remains true that the productivity of many types of personal services—perhaps most fatefully, long-term care for frail elders—cannot be radically improved without, in some way, fundamentally changing the service itself. There is a qualitative difference, for instance, between managing elders with drugs and machinery and caring for them with human beings.

³⁰ “Federal Spending on the Elderly and Children,” Congressional Budget Office, July 2000, <http://www.cbo.gov/>.

³¹ Lionel Robbins, “Notes on Some Probable Consequences of the Advent of a Stationary Population in Great Britain,” *Economica*, no. 25 (April 1929), 79.

³² William J. Baumol and William G. Bowen, *Performing Arts: The Economic Dilemma* (New York: The Twentieth Century Fund, 1966).

Savings and Investment

It is well known that investment and savings are the twin engines behind rising living standards in the long term, since it is investment that increases capital per worker and, at least in a closed economy, investment is limited by savings. A standard estimate is that business investment is responsible for about one-third of the growth rate of productivity—that is, of increases in output per worker. If investment is more broadly defined to include human capital as well (investments in health, education, and public infrastructure), the contribution could be well over one-half. Without adequate investment, economic progress would stall. And without adequate savings, adequate investment could not be financed—or the financing would have to come from abroad.

We have already discussed how demographic aging is likely to affect investment. Ever since the early nineteenth century, economists have observed that higher rates of population growth require higher rates of investment. The logic is clear-cut: Even with no changes in technology, adding more people means more capital spending (as a share of annual output) just to keep the economy functioning as before.

Typically, the cost of this capital broadening or “demographic investment” has been regarded as the difficult price a growing nation must pay for progress. In the postwar era, many development economists have worried that poor economies cannot afford the cost. They consider a high rate of population growth a problem because it requires poor countries to spend so much on capacity-enhancing investment simply to avoid “capital dilution” and keep from falling behind. Yet at times economists have expressed other views. During the 1930s, an era of falling birthrates, shrinking employment, and low investment rates, John Maynard Keynes and others worried that *slower* population growth was a problem because it did *not* force investors to spend and thus threatened to sap aggregate demand and push economies into “secular stagnation.” Although no longer popular, that idea (or variants thereof) occasionally reappears.³³ More recently, economists in the endogenous growth school have stressed the positive feedback between high rates of investment and productivity and living-standard growth.

In any event, regardless of their interpretation, most economists still adhere to the classical view that higher population growth is typically associated with a higher rate of investment (or, in the absence of available savings, a higher real interest rate)—all other things being equal. For societies undergoing demographic aging, of course, that would mean a lower rate of investment (or a lower real interest rate). Although opinions differ about the strength of the effect, most economists assume that it will be quite strong.

This brings us to the crucial question: What will be the impact of demographic aging on available savings? If demographic aging causes the savings rate to rise, or to fall less than the investment rate, then there will be a savings surplus. If it causes the savings rate to fall more than the investment rate, then there will be a savings deficit. Much rides on the balance. In the former (sometimes called “optimistic”) view,

³³ See, for example, David M. Cutler *et al.*, “An Aging Society: Opportunity or Challenge?” *Brookings Papers on Economic Activity* 1990, no. 1 (1990), who argue that the United States should reduce its savings rate to prepare for the lower investment rate associated with demographic aging.

aging developed countries can enjoy falling interest rates and will still be able to ship more of their savings abroad. In the latter (“pessimistic”) view, they will face rising interest rates and need to import more of their savings from abroad.

It wasn’t until the 1950s and 1960s that economists began to gather around a generally accepted theory of savings that might shed light on the impact of demography. This was the “lifecycle consumption hypothesis,” pioneered by Franco Modigliani, which posited that people save or dissave in order to smooth out their lifetime consumption.³⁴ Youth is a time for dissaving (to finance family formation); the rest of working age, and especially midlife, is a time for saving; and old age is again a time for dissaving (to finance retirement). From this theory, economists (including Modigliani) soon began to make some basic inferences: first, that the overall age-tilt was toward saving by the young and dissaving by the old, and second, that higher population growth and higher output growth both tended to raise the economy’s savings rate. Higher population growth does so by swelling the number of (saving) workers relative to (dissaving) elders, while higher output growth does so by putting more income into the hands of workers.³⁵ The implication for the future of the developed countries seems clear enough: Demographic aging, by hugely increasing the share of the population that will be retired and liquidating its saved assets relative to the number of working-age savers, will pull down the savings rate.

Yet there was enough complexity in the lifecycle perspective to throw these initial conclusions into doubt. How important is the dissaving by young families on behalf of their children? Does it matter how much income the old derive from pay-as-you-go benefits rather than from saved assets? What if people start saving more during the working years because they expect to live longer in retirement? As for income growth, young workers might respond in any number of plausible ways: They might save much less if they expect the growth to continue or they might save much more if their consumption habits have not yet adjusted to their new affluence.

Theory itself could not answer these questions. To make progress in understanding the relationship between age and savings behavior, economists needed empirical data. One avenue of research has been micro-studies of income and saving by households within a single economy. The results here have been disappointing and inconclusive, mainly because there is much ambiguity in the age-bracket survey data about which households are actually doing the saving or dissaving at critical lifecycle junctures—for example, before and after intergenerational transfers within families. Young people expecting an inheritance might spend it in advance.

In part to get around such measurement issues, research has increasingly taken another approach—macro-studies that look at the relationship between population age structure and savings rates across many countries. Since the early 1990s, dozens

³⁴ See Franco Modigliani and Richard E. Brumberg, “Utility Analysis and the Consumption Function,” in *Post-Keynesian Economics*, ed. Kenneth K. Kurihara (New Brunswick, NJ: Rutgers University Press, 1954); and Alberto Ando and Franco Modigliani, “The ‘Life Cycle’ Hypothesis of Saving: Aggregate Implications and Tests,” *The American Economic Review* 53, no. 1 (March 1963).

³⁵ The positive correlation between population growth and savings pertains to a steady state. In societies undergoing the demographic transition, the surge in population growth due to falling mortality may pull down savings, because the number of child dependents initially grows much faster than the number of working-age adults.

of such studies have appeared, steadily refining the data and methods as the results poured in. And those results have overwhelmingly supported the initial intuition of the pioneers of the lifecycle consumption hypothesis. (See Figure 3-5.) Nearly all of the studies agree that more people in midlife tend to raise the national savings rate and that more elders over age 65 tend to pull it down. Nearly all agree as well that this effect is much stronger than the effect of children in lowering savings. The clear consensus is that national savings rates in the future of the developed world—a future in which retirees will be abundant and young families scarce—will be considerably lower than they are today. Most of the studies also argue that savings rates will fall more than investment rates. In short, most of the developed world appears to be heading, demographically, for a long-term future of capital scarcity and higher real interest rates—despite the lower investment requirement.

What about the timing and magnitude of the savings reduction? Most of the studies agree that the decline will start around the year 2015 in most developed countries and will accelerate during the 2020s. In the United States, the decline will be complete by 2030, but in Europe and Japan it will continue to deepen through the 2030s. As we have seen, this timing mirrors the rise in old-age dependency ratios across the developed world. There is less agreement about the magnitude of the savings reduction. Depending upon the model, the country, and the assumptions, some studies point to a catastrophic decline of 15 percent or more of GDP, which would wipe out between half and three-quarters of gross national savings in most developed countries and would push it almost all the way down to zero in some. Other studies conclude that the impact will be large but manageable, perhaps 4 percent or 5 percent of GDP. Still others conclude that it will be minor, perhaps 1 percent or 2 percent. Only a very few argue that there will be no impact at all.

There are, however, reasons to think the impact could be larger rather than smaller, due to dynamics not captured fully (or at all) by the models:

First, there is the possibility of slower productivity growth. If the rate of productivity growth, and therefore of per capita income growth, slows in future decades (perhaps in response to declining investment), the slowdown could itself trigger a fall in private-sector savings. Recall that one of the tenets of the lifecycle consumption hypothesis is that savings rates rise or fall with the growth rate of income. It is not difficult to imagine developed-world societies responding to slower income growth and frustrated consumption expectations by borrowing more and saving less.

Second, there is the possibility of large fiscal deficits. Although the macro-models typically include government in their national savings rate measures, none of the historical data used to calibrate the models reflects the extreme fiscal conditions that governments will face in coming decades as the cost of elder entitlement programs grows. If governments are forced to initiate large and chronic deficits to make ends meet, that amount of dissaving will be over and above the model results. To get an idea of the potential impact, consider a scenario in which all of the G-7 countries finance the entire projected (GDP-share) growth in public pension expenditures by borrowing. By 2020, the combined fiscal balance of the G-7 countries would fall by 2.7 percent of GDP and by 2030 it would fall by 5.3 percent of GDP—a deficit swing roughly equal to the entire net national savings of the G-7 countries. (See Figure 3-6.)

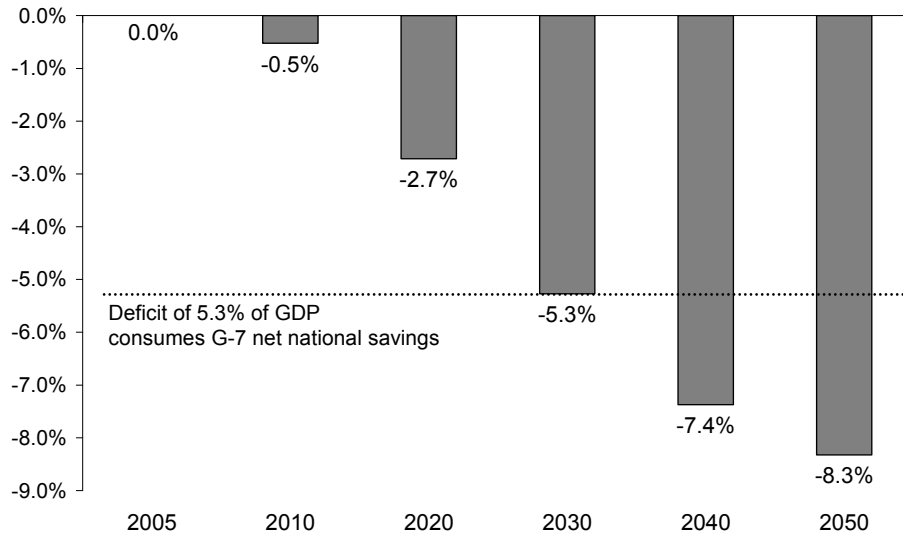
Figure 3-5: Studies Suggesting Demographic Aging Will Have a Negative Impact on National Savings

Study	Countries Included	Type of Study*	Explicit Conclusion that Savings Falls More than Investment
David Weil (1994)	Many countries	R	No
Higgins and Williamson (1997)	East and Southeast Asia	R	No
Heller and Symansky (1997)	Tigers (including China)	R	Yes
Horioka (1997)	Japan	R	No
Higgins (1998)	Many countries	R	Yes
Andersson (1998)	Nordic countries	R	No
Lindh and Malmberg (1999)	Developed countries	R	No
Brooks (2000)	Many countries	G	Yes
Thornton (2001)	US	R	No
Athukorala and Pang-Long (2003)	Taiwan	R	No
Lührmann (2003)	Many countries	R	Yes
Modigliani and Cao (2004)	China	R	No
Fehr, Jokisch, and Kotlikoff (2004)	US	G	Yes
Bosworth and Keys (2004)	Many countries	R	Yes
Feroli (2006)	Many countries	G	Yes
Bryant (2006)	Many countries	G	Yes
Bosworth and Chodorow-Reich(2007)	Many countries	R	Yes

*R = panel regression; G = general equilibrium model.

Source: David Weil, "The Saving of the Elderly in Micro and Macro Data," *The Quarterly Journal of Economics* 109, no. 1 (February 1994); Matthew Higgins and Jeffrey G. Williamson, "Age Structure Dynamics in Asia and Dependence on Foreign Capital," *Population and Development Review* 23, no. 2 (June 1997); Peter S. Heller and Steven Symansky, "Implications for Savings of Aging in the Asian Tigers," IMF Working Paper no. 97/136 (Washington, DC: IMF, October 1997); Charles Yuji Horioka, "A Cointegration Analysis of the Impact of the Age Structure of the Population on the Household Saving Rate in Japan," *Review of Economics and Statistics* 79, no. 3 (August 1997); Matthew Higgins, "Demography, National Savings, and International Capital Flows," *International Economic Review* 39, no. 2 (May 1998); Björn Andersson, "Scandinavian Evidence on Growth and Age Structure," Working Paper no. 1998: 4 (Uppsala: Department of Economics, Uppsala University, 1998); Thomas Lindh and Bo Malmberg, "Age Structure Effects and Growth in the OECD, 1950-1990," *Journal of Population Economics* 12, no. 3 (August 1999); Robin Brooks, "Population Aging and Global Capital Flows in a Parallel Universe," IMF Working Paper no. 00/151 (Washington, DC: IMF, August 2000); John Thornton, "Age Structure and the Personal Savings Rate in the United States, 1956-1995," *Southern Economic Journal* 68, no. 1 (July 2001); Prema-Chandra Athukorala and Pang-Long Tsai, "Determinants of Household Saving in Taiwan: Growth, Demography, and Public Policy," *Journal of Development Studies* 39, no. 5 (June 2003); Melanie Lührmann, "Demographic Change, Foresight and International Capital Flows," MEA Discussion Paper Series no. 038-03 (Mannheim: University of Mannheim, November 2003); Franco Modigliani and Shi Larry Cao, "The Chinese Saving Puzzle and the Life-Cycle Hypothesis," *Journal of Economic Literature* 42, no. 1 (March 2004); Hans Fehr, Sabine Jokisch, and Laurence Kotlikoff, "Fertility, Mortality, and the Developed World's Demographic Transition," CESifo Working Paper no. 1326 (Munich: Munich Society for the Promotion of Economic Research, November 2004); Barry P. Bosworth and Benjamin Keys, "Increased Life Expectancy: A Global Perspective," in *Coping with Methuselah: The Impact of Molecular Biology on Medicine and Society*, eds. Henry J. Aaron and William B. Schwartz, (Washington, DC: Brookings Institution, 2004); Michael Feroli, "Demography and the U.S. Current Account Deficit," *The North American Journal of Economics and Finance* 17, no. 1 (March 2006); Ralph C. Bryant, "Asymmetric Demographic Transitions and North-South Capital Flows," Brookings Discussion Papers in International Economics no. 170 (Washington, DC: Brookings Institution; May 2006); Barry Bosworth and Gabriel Chodorow-Reich, "Saving and Demographic Change: The Global Dimension," Working Papers no. wp2007-02 (Chestnut Hill, MA: Center for Retirement Research, February 2007).

Figure 3-6: Change in Combined G-7 Fiscal Balance, as a Share of GDP, Assuming Projected Growth in Government Pension Spending is Financed by Borrowing, 2005-2050*



*All figures are GDP-weighted and include interest on prior year deficits; net national savings is the average for 1996-2005.

Source: Authors' calculations. See "CSIS Current Deal Projection" in Appendix 1.

Finally, there is the possibility of an “asset meltdown” as a large generation of new retirees (U.S. baby boomers, for instance) starts liquidating their assets (equities especially) by selling them to the smaller midlife generation that is following behind. A severe financial crash could cripple trust in financial markets and impede savings and investment (to say nothing of generating recessionary conditions in the real economy) for many years. To be sure, this scenario, though much discussed, is controversial—and many (perhaps most) economists find no compelling evidence to support it.³⁶ One of the strongest arguments against it is that, with global equity markets, the retirees in a particular country can always find some large generation somewhere in the world to sell to. But what if the meltdown were to occur at a time—say, the 2020s—when all the nations with significant global financial clout found themselves in the same demographic situation? As we are learning with today’s troubled securitized real-estate debt, a global market is no solution if the problem itself is global.

Global Capital Flows

Traditionally, most countries most of the time have had to constrain their rate of investment to their rate of savings. If savings went down, investment had to go

³⁶ See, for example, James M. Poterba, “Demographic Structure and Asset Returns,” *The Review of Economics and Statistics* 83, no. 4 (November 2001); and Kyung-Mook Lim and David N. Weil, “The Baby Boom and the Stock Market Boom,” *The Scandinavian Journal of Economics* 105, no. 3 (September 2003).

down as well—with the help of skyrocketing interest rates if necessary. With the rise of modern global financial institutions in recent centuries, this constraint has weakened, especially during various waves of globalization that have flourished in periods of geopolitical stability. One such wave began in the late nineteenth century and lasted until World War I, under a market-oriented global order led by Great Britain. Another wave has occurred in recent decades—roughly since the end of Bretton Woods in the 1970s—under a market-oriented global order led by the United States. This last wave has been the most sweeping of all. Today, to an extent unknown before in history, a country can borrow abroad with no constraint other than its economic capacity to bear the debt service costs and (perhaps) the political risk that it might default.

This regime of globalized finance, so long as it lasts, will have critical implications for the impact of demographic aging on rates of investment. It means that countries that experience a serious decline in savings due to the lifecycle or fiscal impact of aging—and as we have seen, this probably includes most of the developed countries—may be able to borrow from abroad rather than curtail domestic investment. Just as a rising number of economists project a growing savings shortfall, so too are they projecting a growing capital inflow occurring at about the same time. According to Matthew Higgins, the negative pressure on the developed countries' current account will start to mount around 2010 and grow explosively after 2025.³⁷ Robin Brooks identifies "...a turning point between 2010 and 2030 when North America and the EU are projected to become capital importers as rapid population aging pushes their savings below investment. This shift will be financed by developing countries that will become capital exporters."³⁸ Barry Bosworth and Gabriel Chodorow-Reich likewise conclude that "the large divergence between the future rates of savings and investment implies that all three industrial country groups [the United States, Europe, Japan] will be experiencing large current account deficits in future decades as they sell off assets to support consumption."³⁹

For most of the postwar era, the developed countries were moderate lenders to the rest of the world. In the decades to come, they may well become substantial borrowers from the rest of the world. Indeed, this shift may have already begun over the last decade (since 1999), with the developed countries as a whole recording an unbroken and increasing current account deficit for the first time since World War II and with the developing countries (led by East Asia) exporting capital in unprecedented amounts (at least \$2.0 trillion in just the last four years, 2005 to 2008). Until very recently, capital outflows from the developed countries would encourage excess borrowing, and then financial crises, in certain developing countries—upon which the rich countries would come to the rescue. Over the last

³⁷ Matthew Higgins, "Demography, National Savings, and International Capital Flows," *International Economic Review* 39, no. 2 (May 1998).

³⁸ Robin Brooks, "Population Aging and Global Capital Flows in a Parallel Universe," Working Paper no. wp00/151 (Washington, DC: International Monetary Fund, 2000), 29.

³⁹ Barry Bosworth and Gabriel Chodorow-Reich, "Saving and Demographic Change: The Global Dimension," Working Paper no. wp2007-02 (Chestnut Hill, MA: Center for Retirement Research at Boston College, February 2007).

few years, we have witnessed the reverse: Excess savings in Asia and the Middle East fueling a U.S. residential-property boom that culminated with a financial crisis in which Abu Dhabi, Singapore, and China have had to come to the rescue of Citibank, Merrill Lynch, and Morgan Stanley.

To be sure, there are plenty of shorter-term factors at work in the shift, most notably the expansionary tilt of U.S. fiscal and economic policy after 9/11 (pushing the U.S. current account deficit alone up to around \$800 billion in 2006) and the export-orientation of China's economic policies (enlarging its surplus to \$250 billion in 2006 and an expected \$450 billion in 2008). All the same, the recent trend seems a harbinger of things to come and is likely to accelerate as the demographic drivers come into play.

Is a chronic and growing current-account deficit good or bad? From a certain perspective, it can be seen as a win-win proposition: Aging developed countries will get the investment they need to maintain or boost their labor productivity, while the investors in younger and faster-growing developing countries will get a superior return on their investment. Both sides gain. Yet there are also some serious negative consequences.

First, there is the impact on trade flows. To the extent that the developed world borrows more from the developing world (that is, runs a rising current account deficit as a share of GDP), it will, to the same extent, be importing more in goods and services than it is exporting. Moreover, since the individual developed countries are aging at different rates and are likely to respond with different policies (some more effective at keeping savings rates higher than others), it is very likely that the developed countries will begin running growing trade imbalances with each other even as they run an overall deficit with the developing world. This could inflict great harm on economically critical or politically sensitive industries in the largest deficit countries—and in turn trigger a public backlash against liberal trade policies and globalization. The economic damage and political reaction could be especially severe if, as seems likely, larger current account imbalances around the world also come with larger year-to-year fluctuations.

Second, there is the debt service cost. A country with inadequate savings will do better if it raises the productivity of its domestic economy by borrowing from abroad and investing than if it refuses capital inflows. All the same, borrowing is not costless. When foreign investors purchase a rising share of an economy's debt and business equity, those investors gain a rising share of the economy's income in the form of interest and dividends. If the capital inflows continue long enough, and much of the return on domestic capital (which amounts to at least one-quarter of national income) begins flowing abroad, domestic residents may wake up to find themselves "sharecropping" on an economy owned by outsiders. They will be better off than if the investment were never made, but they will be worse off than if they had saved more and financed the investment themselves. At some point, the cost to living standards will be felt, and when it is, creeping foreign ownership of the economy is certain to become an inflammatory political issue. Indeed, one obvious downside to effortless global borrowing is that it allows a nation to put off policy reforms, thus making the ultimate adjustment more painful, when it would otherwise have to take action and raise savings rates early on.

Third, there is the political influence that is always ceded to the creditor. Among nations as among individuals, chronic borrowers ultimately fall under the sway and influence of chronic lenders. True, the borrower can always threaten the lender with default—but this threat can only be exercised once and, if pursued by major developed countries, would greatly damage the global economic system which the developed countries have the most interest in safeguarding. As levels of indebtedness increase, the real influence would run the other way, since withholding further lending would clearly inflict more pain on the borrower (less consumption) than on the lender (more consumption). The influence would likely be exercised in many venues—from multilateral and trade organizations to alliance agreements—at first subtly and then with greater force. The influence will be felt all the more directly if the cross-border lending in the form of sovereign wealth funds continues to grow, with developing-country governments assuming direct ownership of large shares of major corporations in the United States and Europe. In fact, these governments are already a primary driver of global capital flows: In 2005, net private-sector outflows continued to flow from the developed to developing worlds, while government investment reversed the overall direction. Already holding 75 percent of the world's \$6 trillion in foreign exchange reserves and \$2.5 trillion in sovereign wealth funds, developing-country governments may soon have the capacity to apply pressure exactly when and where they want.

Finally, there is the ultimate risk of default. Liabilities to foreign owners cannot grow indefinitely as a share of GDP. The forces of demography will not relent—and if a country does not enact policies that compensate for the impact of aging, raise its savings rate, and close its current account deficit, some form of national default is sooner or later inevitable. Most likely, markets will react (by pricing down the market value of assets) and lenders will mobilize (to try to force the debtor country to change policies) long before this moment is reached. Yet the timing of price shifts in the market and the direction of mood shifts among investors are notoriously difficult to predict. Most likely, the mere threat of unsustainability in the future will create a climate of extreme volatility where even a minor event could trigger a financial cataclysm.

Only 10 or 15 years ago, it was difficult to find any economist who thought that demographic aging could push most developed nations toward a long-term future of rising capital inflows and current account deficits. The natural direction of capital flows, after all, is from richer nations with more capital per worker and lower rates of return to poorer nations with less capital per worker and higher rates of return. But today, a growing number of economists believe that the aging-driven decline in developed-world savings will reverse the natural flow—and that in the future we will see “capital flowing uphill,” as Federal Reserve Governor Randall S. Kroszner puts it.⁴⁰

Some economists suggest that the unprecedented reversal of global capital flows presents a solution of sorts to the economic privation that aging would otherwise impose on the United States and other developed countries. The argument has been

⁴⁰ Randall S. Kroszner, “International Capital Flows and the Emerging-Market Economies” (speech delivered at the seminar of for Central Bank of Argentina, Buenos Aires, Argentina, May 15, 2007).

made most forcefully by economist and financial expert Jeremy Siegel, who calls it “the global solution.” According to Siegel, “But one future development confronts and neutralizes the age wave: the rapid economic growth in the world’s developing nations. I have determined that the economic development of China, India, and other emerging nations can indeed provide the aging nations with the goods and services that they need to enjoy a comfortable retirement.”⁴¹ The “global solution,” of course, would require decades of current account deficits that allow the developed world to consume more than it produces, and would lead to an enormous transfer of asset ownership from the developed to the developing countries. By mid-century, Siegel calculates, the share of global assets owned by the developing world would grow from one-third to two-thirds.⁴²

Those who argue that the youthful South will come to the rescue of the aging North rarely mention the risks discussed above—the impact on trade, debt service, political influence, and the eventual threat of default. Yet even if we discount these risks, there is another problem—namely, that the developing economies (including China) are not yet large enough to make up for more than a small share of the savings shortfall projected for the developed economies by the 2020s or 2030s. The proponents of the global solution acknowledge this but argue that these economies’ high rates of growth ensure that they will become large enough in the future. But here we encounter two further difficulties: First, poor developing countries may not be able to maintain high rates of growth—which will require vast additional investment within their own domestic economies and which will also probably pull down domestic household savings rates—while also financing retirement consumption in the rich countries. And second, by the 2020s and 2030s, much of the South will itself be growing old. As we will see in the next chapter, the regions expected to finance the global solution—especially East Asia, but to a lesser extent South Asia, the Middle East, and Latin America—are themselves aging and will eventually need to divert a growing share of their production toward the consumption of their own growing elderly populations.

China, in particular, is due to age dramatically beginning in the 2020s. Virtually every study confirms that the lifecycle consumption hypothesis functions much more powerfully in East Asia than the developed countries, perhaps because social insurance systems are not yet well developed and because East Asian families are experiencing a significant erosion of the Confucian ethic that has traditionally allowed elders to rely on their children for support in old age. This means that the dramatic rise in savings that has accompanied declining youth dependency in East Asia in recent decades could turn into a dramatic fall in savings once elder dependency rises. Indeed, from the perspective of China, much of the current capital outflow is clearly motivated by the desire, both by government and within families, to prepare for the future aging of the population. When that aging happens, it would be strange indeed if China did not reduce the outflow—and maybe even attempt to cash in on what it has invested abroad.

⁴¹ Jeremy J. Siegel, *The Future for Investors: Why the Tried and the True Triumph Over the Bold and the New* (New York: Crown Business, 2005), 178.

⁴² Jeremy J. Siegel, “Impact of an Aging Population on the Global Economy,” *CFA Institute Conference Proceedings Quarterly* 24, no. 3 (September 2007), 4.

In other words, by the time the developed world is fully dependent on developing-world savings, the fastest-growing—but also by then fastest-aging—nations in the developing world may be cutting off the flow. Robin Brooks predicts that “It’s going to be a dissaving shock when Asia ages. In one fell swoop that is going to eliminate the low global interest rate environment.”⁴³ Alan Taylor makes this argument even more forcefully: “The predicted demographic shocks are so closely synchronized across rich and poor countries that we cannot expect very significant differences in demographic structures to open up and induce large and persistent capital movements.” As Taylor goes on to note, “Only in Africa is it significantly later (much later), but Africa is, sadly, likely to continue to have such a trivial GDP weight in the world economy that it cannot possibly sustain large capital outflows to finance everybody else’s retirements.”⁴⁴

The developed countries are thus heading down a perilous road. They may be able to import lots of capital from fast-growing developing countries now and in the near-term future (until roughly 2025), as the negative impact of aging on their savings rates begins to be felt in earnest. But just when they have become dependent on this source of capital, and just when their needs are deepening (from roughly 2025 on), the developing countries may need to shut off the spigot and rapidly reverse the direction of the flow of savings. Once again, we sense danger in the 2020s.

This scenario is particularly worrisome for the United States. Although the economic impact of demographic aging will generally be milder in the United States than in Europe or Japan, the United States is highly vulnerable to dependence on foreign capital. To be sure, all other things being equal, we would expect the negative impact on savings to be relatively small given its less severe aging trend. The United States, however, begins with a relatively low private-savings rate and relatively large and growing fiscal deficits. Back in the 1990s, many hoped that the United States would accumulate large near-term budget surpluses while the baby boom was still in the workforce that could later be drawn down to finance its retirement. No one believes this anymore. Instead, we face the coming demographic gauntlet with the lowest national savings rate of any major developed country and a current account deficit that is already at record highs.

Workforce Aging

As demographic aging inverts the developed world’s age pyramid over time, it will also tend to expand the relative number of older workers and shrink the relative number of younger workers. Indeed, this shift is already well under way. As recently as 1980, throughout the developed world, there were just 62 people aged 50 to 64 for every 100 aged 15 to 29. In 2005, there were 94. By 2030, there will be 112. In low-fertility countries, the ratios will climb much higher—to 144-to-100 in Germany

⁴³ Robin Brooks, “Will There Be an Asset Meltdown?” (presentation delivered at the Policy Seminar co-hosted by Macroeconomic Advisers, Council on Foreign Relations, and CSIS, Washington, DC, September 7, 2006).

⁴⁴ Alan M. Taylor, “Commentary: Demographic Changes and International Factor Mobility,” in *Global Demographic Change: Economic Impacts and Policy Challenges*, ed. Gordon H. Sellon Jr. (Jackson Hole, WY: Federal Reserve Bank of Kansas City, 2004), 424-425.

and to 165-to-100 in Japan. If the average retirement age begins to rise significantly in response to reductions in old-age benefits that are all but inevitable, the older-worker brackets will swell even faster. And if the age of youth entry into the labor force continues to rise, the younger-worker brackets will shrink even faster.

A wide array of evidence suggests that economies with graying workforces may be less dynamic and innovative and less able to adapt to rapid market and technological change.

Let's start with some well-known economic characteristics of younger workers. Since they are less likely to be married or have children or to be tied to a settled locality or firm, they have much higher rates of job mobility and require fewer incentives to relocate or retrain themselves for an entirely new career. With many young people in the workforce, labor markets adjust more easily, industries can expand or shrink more rapidly, and unemployment tends to be shorter-term and frictional. With few young people in the workforce, we can anticipate the opposite—more labor market rigidity, slower market adjustment, and longer-term structural unemployment.

As the workforce grays, business management is likely to become more conservative. The employees of the typical firm will have a higher median age, which increases the number of years required for promotion to top managerial positions and, over time, will shift decision-making to those who look forward to retirement, shun risks that endanger their jobs, and generally take a conservative attitude toward innovation. Joseph Spengler, sometimes considered the founder of modern economic demography in the United States, sums up the psychology of an aging workplace (and society) this way: “The decline in the relative number of persons in the younger age group—say under 40—may make the preponderant point of view of industrial and political leadership, together with that of the adult population as a whole, less congenial to change unless change gives promise of substantial returns in the shorter run. For discount rates rise with age, and presumably what some have called ‘animal spirits’ become less buoyant. Prospective payoffs that will conduce to change when decision-makers are younger prove less and less adequate as decision-makers become older.”⁴⁵

For the same reasons, economies with graying workforces are likely to be less entrepreneurial. According to the 2007 Global Entrepreneurship Monitor, which surveys populations in 53 countries, new business start-ups in high-income countries are heavily tilted to the young.⁴⁶ Of all “new entrepreneurs” (defined as an owner of a new business founded within the last three and one-half years), 40 percent are under age 35 and 69 percent are under age 45. Only 9 percent are age 55 or older. Of all new entrepreneurs who expect to create at least 20 jobs within the next five years, the distribution is even more heavily skewed to the young. Due to cultural and institutional differences, the United States and the other English-speaking countries currently maintain a huge advantage in entrepreneurial activity,

⁴⁵ Joseph J. Spengler, *Facing Zero Population Growth: Reactions and Interpretations, Past and Present* (Durham, NC: Duke University Press, 1978), 127.

⁴⁶ Erkkö Autio, *Global Entrepreneurship Monitor: 2007 Global Report on High-Growth Entrepreneurship* (Babson Park, MA and London: Babson College, London Business School, and Global Entrepreneurship Monitor, 2007).

with roughly twice as many new entrepreneurs per capita as most Western European nations and Japan. The gap will probably widen further as the latter nations age more rapidly in the decades ahead.

Now let's turn to indicators of individual productivity that vary with age and consider the findings of the medical science, social psychology, and labor economics literature.⁴⁷ At the level of individual physiology, it is well established that physical capacity begins declining with age over about age 30 across a wide array of indicators, including hearing, eyesight, bone strength, lung and muscle capacity, circulation, and reaction time. More importantly, if we look at tests of cognitive abilities (such as reasoning, spatial orientation, mental speed, learning, and episodic memory), these too decline with age, with most of the abilities beginning to trend down no later than the early 40s. The age-related decline has been extensively documented in both cross-sectional and longitudinal studies. It holds for both men and women and for persons with both high- and low-ability levels. Moreover, these testable abilities have been shown to be highly correlated with workplace success at the individual level. Indeed, some researchers claim that they predict a person's job performance better than any other observable characteristic, including education and prior work experience.⁴⁸

Earnings data tend to bear out the influence of age on productivity. In nearly every developed country, for example, wages peak somewhere in the 45 to 54 age bracket and then decline at higher ages—implying a fall in perceived productivity. Most economists believe that productivity actually peaks somewhat earlier, since “delayed payment contracts” tend to “overpay” older workers in return for their loyalty and dedication. Most studies of self-employed persons and of piece-rate workers show an earlier age of earnings decline than for wage workers. Some studies that evaluate worker productivity at the firm level also confirm this earlier age of productivity decline.

The pattern is not limited to factory workers or office workers. If anything, it is even more marked in the “creative” professions. The negative correlation between age and tenure and academic and creative output has been confirmed many times. Among scientists, the number of publications and the standard of the journals in which they appear declines with age past the 40s.⁴⁹ One analysis of the number of paintings, albums, and books produced by 739 painters, 719 musicians, and 229

⁴⁷ For a survey of the literature, see Vegard Skirbekk, “Age and Individual Productivity: A Literature Survey,” in *Vienna Yearbook of Population Research*, ed. Gustav Feichtinger (Vienna: Austrian Academy of Sciences Press, 2004); and Alexia Prskawetz *et al.*, “The Impact of Population Aging on Innovation and Productivity Growth in Europe,” European Commission, October 2005, http://ec.europa.eu/employment_social/social_situation/studies_en.htm/.

⁴⁸ Gerald V. Barrett and Robert L. Depinet, “A Reconsideration of Testing for Competence Rather than for Intelligence,” *The American Psychologist* 46, no. 10 (October 1991); and Frank L. Schmidt and John E. Hunter, “The Validity and Utility of Selection Methods in Personnel Psychology: Practical and Theoretical Implications of 85 Years of Research Findings,” *Psychological Bulletin* 124, no. 2 (September 1998).

⁴⁹ Paula E. Stephan and Sharon E. Levin, “Measures of Scientific Output and the Age-Productivity Relationship,” in *The Handbook of Quantitative Studies of Science and Technology*, ed. Anthony van Raan (Amsterdam: Elsevier Science Publishers B.V., 1988); and Sharon M. Oster and Daniel S. Hamermesh, “Aging and Productivity among Economists,” *The Review of Economics and Statistics* 80, no. 1 (February 1998).

writers showed that the peak ages for creative output were in the 30s and 40s.⁵⁰ The age distribution of Nobel Prize achievements shows an identical curve—rising steeply in the 20s, peaking in the 30s, and declining steeply in the 40s. Yes, the average age of these achievements rose by six years during the twentieth century, but that rise is entirely accounted for by fewer achievements in the 20s and more in the 30s (presumably due to the longer education now required to get to the forefront of one’s field). There has been no increase in the rate of Nobel achievement after age 45.⁵¹

To be sure, some cognitive abilities seem to decline faster than others. “Fluid” abilities related to reasoning speed and learning in new environments decline more quickly. “Crystallized” abilities related to structured knowledge and accumulated facts (such as verbal ability) decline more slowly or not at all. There are, furthermore, other important abilities that tend to rise or at least remain steady with age—such as experience, patience, maturity (ability to deal effectively with people), and tacit knowledge (practical know-how). Accordingly, most micro- and macro-studies of the effect of age on productivity show an inverted U-shaped pattern, with average productivity (holding variables like education constant) typically growing up to around age 40 and then declining over age 50. Among the macro-studies, recent research by James Feyrer on a large panel of countries indicates that a higher share of workers in their forties is strongly associated with higher rates of productivity growth.⁵²

This suggests that the impact of workforce aging on overall productivity will be at least mildly negative in the developed countries, since the aging of relatively large postwar cohorts (now still partly in their forties) will tend to expand the 50-and-older share of the workforce somewhat more than it will reduce the under-40-share. More important, though, will be the qualitative shift in relative skills and abilities. Whether older workforces will be more or less productive than younger workforces, they will certainly be productive in a very different way. With the large expansion in the number of workers aged 50 and over, we will see more productivity based on experience and accumulated knowledge that works well in stable market environments. With the large shrinkage in the number of workers under age 40, we will see less productivity based on rapid innovation in situations requiring entirely new problem-solving approaches.

This could be a serious disadvantage for the developed countries in an era of rapid technological change. According to demographer Vegard Skirbekk in his review of the literature, “Accelerating technological progress can increase the importance of being able to learn and to adjust to new ways of working, while a long work experience may become less important. This is particularly problematic for older employees, due to age-related declines in processing speed and learning

⁵⁰ Geoffrey F. Miller, “Sexual Selection for Cultural Displays,” in *The Evolution of Culture: An Interdisciplinary View*, eds. Robin Dunbar, Chris Knight, and Camilla Power (New Brunswick, NJ: Rutgers University Press, 1999).

⁵¹ Benjamin F. Jones, “Age and Great Invention,” NBER Working Paper no. 11359 (Cambridge, MA: National Bureau of Economic Research, May 2005).

⁵² James Feyrer, “Demographics and Productivity,” *The Review of Economics and Statistics* 89, no. 1 (February 2007).

capacities.”⁵³ Ann Bartel and Nachum Sicherman find evidence that the risk of job loss is in fact greater among older workers when the rate of technological change is highest.⁵⁴ Some of the studies showing that productivity is generally highest for workforces with the greatest share of workers in their 40s also show that this is *not* true when and where the competitive environment changes rapidly—for example, in the IT sector in the 1990s. In these periods, the peak is younger.⁵⁵ In economic competition, as in military competition, the aging developed countries may be best served by a future in which the pace of technological change slows down.

All of this is sobering not just for what it implies about the baseline projections for the developed economies, but also for what it implies about the limits to a policy strategy aimed at keeping older people active in the workforce beyond 60 or 65. Yes, it is a useful strategy, likely to expand the economy and relieve pressure on public budgets. But we should keep in mind that such workers are not likely to bring with them the same strengths and talents as workers in their 20s, 30s, or 40s.

Market Psychology

So far, we have been looking at how demographic aging will affect economic performance in ways that are mostly quantifiable in conventional economic terms—industrial structure, savings and investment, financial flows, and worker productivity. Here we turn to the psychological and institutional dimension of demographic aging. When economists and historians try to describe the special economic vitality that often characterizes eras of high versus low population growth—the nineteenth century versus the fifteenth century in Europe, for example, or the 1960s versus the 1930s—they often allude to a contrast in mood that cannot be reduced to a strictly classical analysis of the production function. The classical analysis, indeed, usually argues that a stationary or declining population should translate into better economic performance (by lifting the ratio of labor to land and to other fixed natural resources). Yet eras of high population growth have their own special attributes that are harder to define within standard theory—a restlessness, mobility, urgency, and optimism.

John Maynard Keynes and his American counterpart Alvin Hansen always emphasized the role of population growth in triggering what Keynes called the animal spirits of investors. John Hicks, in his famous review of Keynes’ *General Theory*, remarked: “Expectation of a continually expanding market, made possible by increasing population, is a fine thing for keeping up the spirits of entrepreneurs. With increasing population investment can go roaring ahead, even if invention is rather stupid; increasing population is therefore actually favorable to employment....

⁵³ Vegard Skirbekk, “Age and Individual Productivity: A Literature Survey,” MPIDR Working Papers no. wp2003-08 (Rostok: Max Planck Institute for Demographic Research, 2003), 8.

⁵⁴ Ann P. Bartel and Nachum Sicherman, “Technological Change and Retirement Decisions of Older Workers,” *Journal of Labor Economics* 11, no. 1 (January 1993).

⁵⁵ Bartel and Sicherman, *op. cit.*; Avner Ahituv and Joseph Zeira, “Technical Progress and Early Retirement,” CEPR Discussion Paper no. 2614 (London: Centre for Economic Policy Research, November 2000); and Robert L. Clark, E. Anne York, Richard Anker, “Economic Development and Labor Force Participation of Older Persons,” *Population Research and Policy Review* 18, no. 5 (October, 1999).

One cannot repress the thought that perhaps the whole Industrial Revolution of the last two hundred years has been nothing else but a vast secular boom, largely induced by the unparalleled rise in population.”⁵⁶ The great postwar economist Simon Kuznets emphasized many of the same themes. Joseph Spengler offers a concise summary of his views, “Kuznets infers that a growing labor force will be more mobile and flexible than a stationary one, and that a population which is growing and hence younger will be more responsive to new products and hence to inventiveness and ‘forward-looking’ ventures and investment than will a non-growing and more stagnant population.”⁵⁷

There are two dynamics in particular that may give rise to psychological and institutional differences between eras of high and low population growth:

The first is the stagnation of product markets. As we have already seen, the long-term decline in the working-age population projected for most developed countries implies a dramatic slowdown in the long-term trend in GDP—and in some countries a virtually static or perhaps even a declining trend in GDP. This in turn means that the demand for goods and services in the typical industry or sector will have little tendency to grow (in real terms) from year to year or from decade to decade. Individual firms are likely to take fewer risks to capture new sales when they know that their industry as a whole cannot grow. They will have less opportunity to innovate in their means of production, since the typical firm will have no need to expand its production capacity and therefore to invest (other than to replace depreciated capital). They will be especially averse to production cutbacks, since their existing capacity is already a “sunk cost.” When product demand is weak, firms facing a zero-marginal cost of production may trigger waves of predatory price cuts. And once the industry or sector becomes troubled, with low or declining returns, few new entrepreneurs will want to enter it and many managers of existing firms will seek (openly or clandestinely) agreements not to compete. At the extreme, they will lobby for protection or subsidies from the public sector—using the argument that the very existence of the industry or sector is at stake. When markets are no longer growing, such arguments may seem persuasive.

A parallel situation may arise in labor markets. In any dynamic and efficient market economy, some firms and industries are always growing—and others are always shrinking—relative to total output. When total population and therefore total output is growing rapidly, such shrinkage can ordinarily occur without reducing the total number of workers employed in an industry. It would simply mean that fewer (or no) new workers would be hired in that industry over time. When total population is stationary or declining, however, even a minor relative decline in an industry’s share of total output will require an outright reduction in the number of workers the industry employs. The displaced workers may suddenly find their skills and experience valueless in the labor market and will face the difficult task of retraining and relocating, sometimes at an advanced age. Firms may be less willing

⁵⁶ Quoted in Joseph Spengler, *Facing Zero Population Growth: Reactions and Interpretations, Past and Present* (Durham, NC: Duke University Press, 1978), 62-63.

⁵⁷ Spengler, *op. cit.*, 148.

to release experienced workers in this manner, workers may accept lower wages to avoid termination, unions may force a “first-hired, last-fired” policy on firms (which simply pushes the adjustment costs onto younger workers), or the public sector may be called on to intervene and ask taxpayers to pay for the adjustment cost (a task that the public sector rarely accomplishes fairly or efficiently).

The economist Benjamin Friedman likens the difficulty of transferring current workers from one firm or industry to another (as opposed to simply hiring more new workers in one rather than the other) to the difficulty of reducing the nominal wages in a firm or industry (as opposed to simply letting them rise more slowly than inflation).⁵⁸ In order to avoid the latter difficulty, modern monetary authorities typically target a positive (if mild) rate of inflation. To avoid the former difficulty, it would be useful for an economy to experience a positive (if gradual) rate of population growth—though of course no public authority has the power to guarantee such an outcome. Just as a little bit of inflation is “good” because it allows for frictional and sectoral job loss in a world of downwardly sticky wages, so too is a little bit of population growth “good” because it allows for the same in a world where older workers tend to be immobile.

In an open global economy, of course, international trade can mitigate the impact of stagnant or contracting domestic markets. So can advances in technology, which both expand the range of goods and services that are tradable across borders (think of financial services) and facilitate labor-market adjustments when an industry or sector declines (think of how the Internet makes it easier for workers to find new jobs, work remotely, or train for new careers). Yet the onrush of globalization and technology notwithstanding, most of the goods and services produced in today’s developed economies cannot easily be traded across borders. And remember: Even to the extent that they can be traded, it will not help if a country’s trading partners also have stagnating economies. The majority of exports of most developed countries—and in Europe, usually the great majority—are to other developed countries.

Over time, the stagnation of both product and labor markets is likely to push businesses, unions, and political leaders to lobby for anti-competitive changes in the economy. We may see growing cartel behavior (on the product side) to protect market share and more restrictive rules on hiring and firing (on the labor side) to protect jobs. We may also see increasing pressure on governments to block foreign competition, giving added strength to the calls for trade protectionism due to large and variable current account deficits.

Most of today’s liberal democracies have long been wed to free-trade principles. As they age, moreover, they will have even stronger reasons to promote globalized trade: both to bolster productivity growth through the enhanced global division of labor and to facilitate the massive capital inflows that (some believe) the developed countries will need in order to cover the mounting costs of elder dependency. Yet if the market psychology of an aging economy comes to be marked by extreme aversion to any loss of sales or loss of jobs at the firm, industry, or sectoral level, it could easily fan the flames of protectionism. Historically, eras of stagnant population growth and market growth (in addition to the 1930s, the fifteenth and seventeenth centuries come

⁵⁸ Benjamin M. Friedman (Harvard University), interview by authors, December 28, 2006.

to mind) have been characterized by rising tariff barriers, autarky, corporatism, syndicalism (or guilds), market management, and other anti-competitive policies that tend to shut the door on free trade and on free markets generally. To the extent that the market psychology of an aging society has a public-policy dimension, the effort to minimize market risk and trade volatility would certainly be its hallmark.

Whether or not the developed economies tilt toward protectionism, the threat of creeping sclerosis remains. As we have seen in previous sections, the vintage of their stock of both physical and human capital will be aging. The age (and therefore risk aversion) of the typical firm manager will be rising, as will the age (and therefore inflexibility and immobility) of the typical worker. Add to this—in the realm of market psychology—an inability to absorb significant market loss without decommissioning capital or firing workers, and the result, economy-wide, could be an extreme inflexibility and sense of vulnerability in the face of rapid market change.

The risk of course varies significantly across the developed countries. It is greatest in Japan and fast-aging European countries like Germany, Italy, and Spain, where populations will contract sharply and real GDP may stagnate in decades to come. The United States will not only continue to have a growing population and a growing GDP; its economy is less regulated and its labor markets are more flexible. As always, culture and institutions matter. The greater U.S. emphasis on risk-taking, entrepreneurship, and mobility could prove a powerful antidote to the zero-sum market psychology that may afflict much of the rest of the developed world.

CHANGES IN SOCIAL MOOD

Demographic aging will affect more than the size and structure of the population and economy. The burgeoning proportion of elderly in the population, the smaller size of families, and growing ethnic diversity promise to recast every facet of society, from the popular culture to politics. More fundamentally, they could shift society's overall direction and political agenda. Will aging populations be less inclined to pursue long-term solutions or take decisive or risky collective decisions? Will smaller families and more protective parents be willing to risk their scarce children in times of war? Will growing ethnic minorities pressure governments to realign foreign policies? And will elderly-dominated electorates use their political power to protect their own interests at the expense of younger and future generations?

Granted, these possible shifts in social mood are more qualitative and uncertain than the shifts we have discussed up to now. Yet they may carry the greatest consequence and are more difficult to alter. Sound policy measures can blunt many of the more harmful fiscal and macroeconomic impacts of population aging. Demographically driven shifts in social psychology, however, may be more or less ingrained in society's DNA—and, as a result, could be less responsive to policy measures.

Individual Psychology

Across history and cultures there has existed a strikingly universal assumption that age corresponds to specific behaviors and roles, characterized neatly by Cicero's

axiom: “Young men for action, old men for counsel.” The young are rash, energetic, and intent on breaking with the past, while the aged are cautious, wise from experience, and conservative guardians of the past. More traditional, non-Western (and especially Confucian) cultures generally value older-age traits over those associated with youth. The Western humanist tradition embraces a different view, emphasizing the need for a healthy influx of regenerative youth to balance enervating age. Jonathan Swift’s *Gulliver’s Travels* provides perhaps the most pessimistic portrait of aging. His imagined world contains a special caste of super-aged, immortal “Struldbrugs” who are incapable of learning new things, speak an unintelligible archaic dialect, and are a deadweight on the rest of society. When the prospect of demographic aging first began to loom large over Europe’s future in the mid-twentieth century, the great French demographer Alfred Sauvy, harking back to the humanist tradition, wrote about a coming “society of old people, living in old houses, ruminating about old ideas.”⁵⁹

Such apprehensions may not be entirely unwarranted. Psychological studies generally confirm longstanding conventional assumptions about age and temperament.⁶⁰ Of course, much is gained with age. As we have seen, our crystallized intelligence improves, which means that we get better at skills that require prior experience or a large knowledge base. Our ability to see the “big picture” generally improves until late adulthood, or into our 60s or 70s. New research also suggests that we can regulate our emotions better, emphasizing the positive while letting the negative roll off our backs.⁶¹ Violent criminal activity and aggression among men, meanwhile, subside. But much is lost with age, too. Our fluid intelligence, or mental agility, declines after early adulthood, or our 20s. Our late adolescence and early adulthood years are also our most formative, after which we become more conservative in the sense that we become less open to new experiences and less likely to reconsider deeply held, highly symbolic political values or switch political party allegiances.⁶² As we age, we also grow more apt to avoid decision-making when the risk of negative consequences is high.⁶³

What causes these behavioral changes? The decline in fluid intelligence is purely an “age effect.” In other words, it is biologically determined that sheer math ability deteriorates beyond a certain age, regardless of whether one lives an additional 10 or 40 years. Risk avoidance, on the other hand, is for the most part a rational response to shortening time horizons, or the number of years left in life. As we age, we have

⁵⁹ Quoted in Ben J. Wattenberg, *The Birth Dearth* (New York: Pharos Books, 1987), 65.

⁶⁰ For an overview of the psychological and behavioral changes associated with the aging process, see, for example, Richard A. Posner, *Aging and Old Age* (Chicago: University of Chicago Press, 1995); and David J. Ekerdt, ed., *The Encyclopedia of Aging* (New York: MacMillan, 2002).

⁶¹ Laura L. Carstensen and Joseph A. Mikels, “At the Intersection of Emotion and Cognition: Aging and the Positivity Effect,” *Current Directions in Psychological Science* 14, no. 3 (June 2005).

⁶² Robert R. McCrae *et al.*, “Age Differences in Personality Traits Across Cultures: Self-Report and Observer Perspectives,” *European Journal of Personality* 18, no. 2 (March 2004); and Duane F. Alwin and Jon A. Krosnick, “Aging, Cohorts, and the Stability of Sociopolitical Orientations Over the Life Span,” *The American Journal of Sociology* 97, no. 1 (July 1991).

⁶³ See Mara Mather, “A Review of Decision-Making Processes: Weighing the Risks and Benefits of Aging,” in *When I’m 64*, eds. Laura L. Carstensen and Christine R. Hartel (Washington, DC: The National Academies Press, 2006).

less time to recover from losses. This “time horizon effect” is well-documented in finance: As a rule of thumb, prudent investors are advised to increase the proportion of safe (but lower-return) bonds to risky (but higher-return) stocks as they age. As for growing ideological inflexibility, part of the explanation lies in the difficulty in absorbing new information, especially after developing a body of knowledge fortifying views. But there is also less incentive for older persons to radically challenge the status quo which they have invested in and helped to create. Nor is there as much incentive for a person with shortening time horizons to make or support long-term investments—in personal relationships, finance, or even policy initiatives.

As societies age, they may also assume an aging disposition. In every major developed country except for the United States, median ages will rise from the late-30s to early-40s today to the mid-40s to mid-50s by 2050. As they do, aggregate crystallized intelligence will deepen and fluid intelligence will diminish, while the average distance of each citizen from his or her youthful formative experiences will lengthen. Aggregate time horizons in the developed world—that is, the number of years of life remaining, on average, to the population—have changed remarkably little in the developed world over the past 50 years. That, however, will not be the case in the coming 50. Today, the share of the population with less than 20 years of life left is no more than one-fifth in any major developed country. By mid-century, the share will rise to nearly one-third in Japan, Germany, and Italy. (See Figure 3-7.)

Figure 3-7: Share of Population in the G-7 Countries with Less than 20 Years of Life Remaining, 2005-2050

	1950	2005	2030	2050
Canada	13.8%	14.0%	20.7%	23.0%
France	20.4%	17.1%	21.2%	22.4%
Germany	20.5%	21.9%	26.9%	30.0%
Italy	14.9%	21.3%	25.3%	31.9%
Japan	12.5%	18.5%	26.3%	32.3%
UK	20.2%	18.0%	22.1%	24.3%
US	16.3%	14.3%	18.5%	18.7%

Source: Authors' calculations based on *World Population Prospects* (UN, 2007); and Human Mortality Database, University of California, Berkeley and Max Planck Institute for Demographic Research, <http://www.mortality.org/>.

Family Size and Structure

Low fertility, the principal force driving population aging, is also reshaping family size and structure. Fifty years ago, large families of three or more children were common in the developed countries. Today, the great majority of parents have just one or two. Even in the relatively high-fertility United States, the share of women completing their childbearing years with three or more children fell from 58 percent for the 1930 birth cohort to 31 percent for the 1955 birth cohort. The share with

four or more fell even more dramatically, from 34 percent to 11 percent.⁶⁴ This means that children are now much more likely to be firstborn and to grow up with no or few siblings. As we have seen, a rising share of adults are also choosing to have no children at all. About one in seven U.S. women are now ending their childbearing years without offspring—and in many European countries, the number is (or will soon be) between one in five and one in four.⁶⁵

Meanwhile, in Japan and the low-fertility countries of Europe, the extended family will soon be a thing of the past. Nicholas Eberstadt estimates that by mid-century close to 60 percent of all Italian children will have no siblings, cousins, and aunts or uncles.⁶⁶ Even as the family tree narrows, growing life expectancy is making it taller. In other words, though lacking in siblings, cousins, and aunts or uncles, those Italian children will have numerous living grandparents and great-grandparents.

The growing proportion of the population that is firstborn or reared in small families could affect the tone of society. On the upside, parental investment per child will increase, and this is likely to confer developmental advantages. Firstborns and children from small families tend to score higher on aptitude tests and achieve greater professional success.⁶⁷ But on the downside, new research is finding that only children have more trouble developing social skills,⁶⁸ and thus may be less “team-oriented” as adults. Meanwhile, research by psychologist Frank J. Sulloway suggests that firstborns, because they identify more with their parents, are less open to innovation and more likely to be conformist and support the status quo.⁶⁹ According to Sulloway, later-borns, in contrast, are “born to rebel” against the existing order—and indeed, have provided most of the leading figures in such upheavals as the Protestant Reformation, the French Revolution, and the women’s rights movement. Middle-born children—who are rarities in a low-fertility environment—are more peer-oriented and deft negotiators.

Although some of these findings are controversial, they may point to a future in which conventionally high-achieving but socially aloof adults predominate over rebellious thinkers and social mediators. If so, smaller family size may be pushing the developed countries in the same direction as rising average age: toward cultural and political conservatism and a diminished inclination for risk-taking.

One likely consequence of smaller family size that has been much discussed in the security community is growing casualty aversion. Historically, many societies have exempted last-surviving or only sons from military service. In a world in which

⁶⁴ Tomas Frejka and Jean-Paul Sardon, “Cohort Birth Order, Parity Progression Ratio and Parity Distribution Trends in Developed Countries,” *Demographic Research* 16, no. 11 (April 2007).

⁶⁵ Thomáš Sobotka, *Postponement of Childbearing and Low Fertility in Europe* (Amsterdam: Dutch University Press, 2004).

⁶⁶ Quoted in Phillip Longman, *The Empty Cradle* (New York: Basic Books, 2004), 63.

⁶⁷ See, for example, Judith Blake, *Family Size and Achievement* (Berkeley, CA: University of California Press, 1989); and Petter Kristensen and Tor Bjerkedal, “Explaining the Relation Between Birth Order and Intelligence,” *Science* 316, no. 5832 (June 22, 2007).

⁶⁸ Douglas B. Downey and Dennis J. Condran, “Playing Well with Others in Kindergarten: The Benefit of Siblings at Home,” *Journal of Marriage and Family* 66, no. 2 (May 2004).

⁶⁹ Frank J. Sulloway, *Born to Rebel: Birth Order, Family Dynamics, and Creative Lives* (New York: Pantheon Books, 1996).

many (or even most) families have only one son, parents may be more reluctant to risk their offspring in war. The argument has been forcefully made by such prominent security experts as Edward Luttwak, James Kurth, and Gunnar Heinsohn,⁷⁰ who warn of a sort of “Saving Private Ryan” effect writ large. Others point out, however, that there is as yet little empirical evidence of a causal link between family size and casualty aversion.⁷¹ What is undeniable is that societies in the developed world have, in recent decades, become more protective of children and more averse to casualties. Smaller family size will not reverse this trend, and it may reinforce it.

Although parents may become more protective of scarce children, that very scarcity means that society will be more adult-focused. With fewer children to care for and childrearing consuming fewer years of adulthood, adults will have more time to focus on their own individual pursuits. In some ways, this is a good thing. Smaller family size, for example, has been instrumental in freeing up women’s time to participate in the labor force. But too much focus on the self can come at the expense of focus on the future beyond our own lives. Societies with high levels of childlessness may have lower levels of what social scientists call “generativity,” or concern for following generations. Some studies have found that men who never experience parenting are less likely to engage in volunteer work or make investments in local communities.⁷²

An attenuated extended family, meanwhile, will have difficulty fulfilling the functions of traditional large families. The bonds within smaller families may, on average, be closer and of higher quality. Yet there is something about size that matters. Families do more than just raise children. They also function as safety nets for members at all stages of the lifecycle, create powerful links to the community, and provide important networking connections for securing jobs. Perhaps it is no surprise that the great collapse of social capital in the United States tracked by Robert Putnam in *Bowling Alone* has coincided with a decline in family size.⁷³ To fill the void, governments may be compelled to take on new functions previously reserved to the family—with ominous implications for budgets that are already overstretched by the rising cost of current benefit commitments.

Growing Ethnic Diversity

Another kind of demographic transition is transforming the developed countries—one of growing ethnic and religious diversity, driven by high rates of immigration

⁷⁰ Edward N. Luttwak, “Where Are the Great Powers? At Home with the Kids,” *Foreign Affairs* 73, no. 4 (July/August 1994), 27; James Kurth, “One-Child Foreign Policy,” *The American Conservative*, August 27, 2007; and Gunnar Heinsohn, *Söhne und Weltmacht: Terror im Aufstieg und Fall der Nationen* (Zurich: Orell Füssli, 2006).

⁷¹ For a general discussion of casualty aversion, see Hugh Smith, “What Costs Will Democracies Bear? A Review of Popular Theories of Casualty Aversion,” *Armed Forces & Society* 31, no. 4 (Summer 2005).

⁷² See, for example, Dan P. McAdams and Ed de St. Aubin, “A Theory of Generativity and Its Assessment Through Self-Report, Behavioral Acts, and Narrative Themes in Autobiography,” *Journal of Personality and Social Psychology* 62, no. 6 (June 1992).

⁷³ Robert D. Putnam, *Bowling Alone: The Collapse and Revival of American Community* (New York: Simon & Schuster, 2000).

and, to a lesser extent, higher immigrant fertility. A record 3 percent of the world's population is now living outside their country of origin.⁷⁴ The rise in the foreign-born share is especially dramatic in the developed world. Today, 13 percent of the population in the United States was born abroad, a level not seen since the last great wave of immigration a century ago, and in Western Europe, a region once known as a source of migrants, the shares of foreign born—8 percent in France, 10 percent in the UK, 13 percent in Germany—are at all-time highs.⁷⁵ A large share of the foreign born in most countries come from younger, faster-growing developing regions, notably Latin America in the case of the United States and the Muslim world in the case of Western Europe. This is not surprising. Along with the attraction of higher wages, a deficit of young native workers draws in young immigrant labor to aging developed countries.

While immigration always creates social stresses, the rapid growth in Muslim and Hispanic minorities in Europe and the United States is raising special concerns—both because of their large numbers and because of fears that they may prove more resistant to assimilation than other groups. Will the growth in these ethnic and religious minorities undermine social cohesion? Will it provoke a backlash among majority populations? Will it give rise to a “diaspora politics” that steers foreign policy in new directions? While both the United States and Europe both face challenges, there appears to be more cause for concern in Europe.

Let's begin with a closer look at the numbers—and let's start with Western Europe. Knowing the exact size of its Muslim population is impossible, since most countries do not collect comprehensive data on the ethnic origin or religious affiliation of residents—and for some countries, including France, which has Western Europe's largest Muslim population, there are no official data at all. Most careful estimates place the total number of Muslims in Western Europe (including both native-born and foreign-born) at somewhere between 13 million and 17 million, or roughly 3 percent to 5 percent of its total population (including the UK).⁷⁶ All agree, moreover, that the number has risen dramatically in recent decades, perhaps doubling over the past 10 to 15 years alone.

If counting the number of Muslims in Europe today is problematic, projecting their future number is even more so. It requires data not just on the size and age distribution of the current Muslim population, but assumptions about future Muslim immigration and fertility. Because we know so little about the key variables, different projections can produce very different results. Based on a review of the available data and what we believe to be reasonable assumptions (see Appendix 1), we have projected the Muslim population of France and Germany through 2050.

⁷⁴ *International Migration 2006* (New York: UN Population Division, 2006).

⁷⁵ *International Migration Outlook* (Paris: OECD, 2007).

⁷⁶ See Ceri Peach, “Muslim Population of Europe: A Brief Overview of Demographic Trends and Socioeconomic Integration, with Particular Reference to Britain,” in *Muslim Integration: Challenging Conventional Wisdom in Europe and the United States* (Washington, DC: CSIS, 2007); Jonathan Laurence and Justin Vaisse, *Integrating Islam: Political and Religious Challenges in Contemporary France* (Washington, DC: Brookings Institution Press, 2006); *Muslims in the European Union: Discrimination and Islamophobia* (Vienna: European Union Monitoring Centre on Racism and Xenophobia, 2006); and U.S. Central Intelligence Agency, *The World Factbook 2008* (Washington, DC: Potomac, 2008), <https://www.cia.gov/library/publications/the-world-factbook/index.html/>.

Under these projections, the Muslim share of the population in France would rise from an estimated 8 percent in 2005 to 22 percent in 2050, while in Germany it would rise from 4 percent to 38 percent. (See Figure 3-8). In both cases, the growth is driven primarily by immigration, which we assume will remain constant relative to the Muslim stock in each country (reflecting the “network” effect familiar to immigration experts). The much-discussed differences in fertility rates and age structures between Muslim and non-Muslim populations play a relatively small role. The Muslim population grows much faster in Germany than France because Muslim immigration is much higher relative to the Muslim stock.

Figure 3-8: Muslim or Hispanic-Origin Share of the Population in Selected Counties, 2005-2050

	2005	2030	2050
<i>Muslim Share of Population</i>			
France	8.3%	15.2%	22.2%
Germany	4.3%	16.3%	38.3%
<i>Hispanic Share of Population</i>			
US	14.1%	20.1%	24.4%

Source: For France and Germany, authors' calculations (see “Projections of Muslim Populations” in Appendix 1); for the United States, U.S. Interim Projections by Age, Sex, Race, and Hispanic Origin, U.S. Census Bureau, March 2004, <http://www.census.gov/ipc/www/usinterimproj/>.

Unlike most European countries, the United States compiles detailed population data by race and Hispanic origin. Yet even here there is considerable uncertainty in the projections because of the large illegal inflow and assumptions about whether it will continue. Hispanics now constitute 15 percent of the U.S. population, up from 4 percent in 1960, and recently surpassed African Americans as America’s largest minority. According to U.S. Census Bureau projections, the Hispanic share of the population will reach 24 percent by mid-century, and this is assuming a decline in the historical rate of immigration.⁷⁷ According to immigration expert Jeffrey Passel, Hispanics could be almost one-third of the U.S. population by 2050 if the immigration rate remains constant at its average level of the past 35 years.⁷⁸ In Arizona, California, New Mexico, and Texas, the Hispanic share of the population would approach (or exceed) 50 percent by mid-century—even under the Census Bureau projections.

As the size of Muslim and Hispanic minorities grows, Europe and the United States will confront a number of common challenges.

There is a long-standing debate among social scientists about the impact of diversity, and particularly ethnic diversity, on social cohesion. The “contact theory” argues that diversity, by familiarizing people of different cultures with one another,

⁷⁷ U.S. Interim Projections by Age, Sex, Race, and Hispanic Origin, U.S. Census Bureau, May 11, 2004, <http://www.census.gov/ipc/www/usinterimproj/>.

⁷⁸ Jeffrey S. Passel and D’Vera Cohn, “U.S. Population Projections: 2005-2050,” Pew Hispanic Center, February 11, 2008.

promotes greater levels of tolerance, trust, and solidarity between groups. The “conflict theory” argues that greater diversity breeds distrust of other groups and greater trust within one’s own group. A large nationwide survey of American communities carried out in 2000 by Robert Putnam raises a third and troubling possibility.⁷⁹ After controlling for relevant variables, from education and income to age and citizenship-status, Putnam found that in communities with higher levels of diversity there was less trust at all levels—both between and within ethnic groups. He argues that building social capital amid growing diversity will require encouraging “permeable, syncretic, ‘hyphenated’ identities; identities that enable previously separate ethnic groups to see themselves, in part, as members of a shared group with a shared identity.”⁸⁰

The degree of solidarity within society—that is, the extent to which one identifies with one’s own group or the whole—may affect public support for core social institutions, particularly the welfare state. David Goodhart, editor of the *Prospect*, a progressive British magazine, worries that high levels of diversity may be incompatible with expansive welfare states, since these are ultimately based upon sharing. “Therein,” he writes, “lies one of the central dilemmas of political life in developed societies: sharing and solidarity can conflict with diversity. This is an especially acute dilemma for progressives who want plenty of both solidarity—high social cohesion and generous welfare paid out of a progressive tax system—and diversity—equal respect for a wide range of peoples, values and ways of life.”⁸¹ This dilemma may be particularly worrisome for aging societies with young and growing ethnic minorities. Over time, the contributors (young workers) will be disproportionately from one group and the recipients (aged retirees) disproportionately from another.

Welfare state politics aside, growing ethnic and religious minorities could change the political landscape. They will certainly constitute new political constituencies with their own domestic agendas. They may also introduce a new “diaspora politics” into debates over foreign policy. In the modern era of globalized media, instantaneous communication, inexpensive transportation, frequent circular migration, and widespread dual nationality, immigrants are more aware of and connected to political developments in their countries of origin than those of previous eras. This has already affected the politics of origin countries. Mexican presidential candidates now routinely campaign in the United States, as do some Turkish politicians in Germany. As minorities grow in number and political clout, they may pressure adoptive country governments to adjust policy stances toward their origin countries. We may see a larger Muslim dimension to European foreign policy and a larger Latin-American dimension to U.S. foreign policy.

In the end, the impact of growing diversity will depend on how successfully Muslims and Hispanics assimilate into their host societies.

The degree of success may depend in part on the cultural distance between minorities and majorities. The distance between Hispanics and the U.S. majority is arguably less than between Muslims and the European majority. Like most other

⁷⁹ Robert D. Putnam, “*E Pluribus Unum*: Diversity and Community in the Twenty-First Century: The 2006 Johan Skytte Prize Lecture,” *Scandinavian Political Studies* 30, no. 2 (June 2007).

⁸⁰ Putnam, *op. cit.*, 161.

⁸¹ David Goodhart, “Too Diverse?” *Prospect*, no. 95 (February 2004), 30.

Americans, Hispanics are Christian. Hispanics and non-Hispanics also have similar levels of polled religious intensity and views on “family values.”⁸² The distance is larger in Europe, where Muslim minorities in most countries are more religious and socially conservative than European majorities (France being a notable exception). The global Islamic revival, by reinforcing Pan-Islamic identity, may be accentuating these differences.

Perhaps more important, however, is a host society’s cultural openness to immigrants and its ability to integrate them into the economy. The United States, like Australia and Canada, has always been a country of immigrants. Most Western European countries do not have the same tradition. Historically, most have been much more ethnically homogenous than the United States, and some (Germany as recently as 2000) explicitly defined citizenship in terms of ethnicity. Even today, very few European countries automatically confer citizenship on second-generation immigrants at birth, as does the United States. Such cultural cues may signal to immigrants that they are not welcome as permanent and equal members of their adoptive societies. There are also large differences between the United States and Europe in their capacity to provide employment to newcomers and facilitate their upward mobility. The flexibility of U.S. labor markets promotes economic integration. In much of Europe, the lack of labor-market opportunity contributes to economic and social marginalization.

For all of these reasons, Hispanics appear to be assimilating more rapidly in the United States than are Muslims in Europe. This is certainly true economically. Hispanic unemployment rates are only marginally higher than the national average. And though average household income is lower, the wage gap is narrowing steadily from generation to generation. One study estimates that second-generation Mexican men halve the lifetime earnings gap with non-Hispanic white men that existed in the first generation.⁸³ The poor quality of socio-economic data for Muslims in Europe makes it nearly impossible to directly compare their experience with that of Hispanics in the United States. But the overwhelming consensus is that economic integration has stalled. According to many experts, Muslim unemployment rates are high (perhaps double or triple non-Muslim rates in some countries), and the second generation is not faring better in the wage market than the first.⁸⁴ With many consigned to “no-go” urban slums (like the French *banlieus*), social mobility is beyond their reach.

Perhaps it is no surprise that we are seeing diverging trends in cultural assimilation as well. With each generation, Hispanics are more likely to self-identify as American than with their country of origin.⁸⁵ They are also volunteering for the military in large numbers—perhaps the ultimate test of assimilation. In 2005, a time of war, they comprised 14 percent of all military enlistees, not far below their share

⁸² 2002 *National Survey of Latinos* (Washington, DC: Pew Hispanic Center and Kaiser Foundation, 2002).

⁸³ James P. Smith, “Assimilation Across the Latino Generations,” *The American Economic Review* 93, no. 2 (May 2003).

⁸⁴ See, for example, Timothy M. Savage, “Europe and Islam: Crescent Waxing, Cultures Clashing,” *The Washington Quarterly* 27, no. 3 (Summer 2004).

⁸⁵ Pew Hispanic Center and Kaiser Foundation, 2002, *op. cit.*

of the enlistment-age population (18 percent).⁸⁶ It may be true that Hispanics are assimilating more slowly than earlier waves of immigrants, but there is little doubt about the overall direction.

Meanwhile in Europe, the trend is going the other way. Even in France, whose Muslim population is the most secular in Europe, Muslims under the age of 35 are more likely than older Muslims to identify as Muslim first and French second (51 percent to 36 percent).⁸⁷ Younger and second-generation Muslims across Europe also tend to hold more extremist views than older or first-generation Muslims. One British poll found that Muslims aged 16 to 24 were more than twice as likely to favor living under Shari'a law as Muslims aged 55 and over. They were also more likely than their elders to say that they have more in common with Muslims abroad than with non-Muslims in Britain.⁸⁸

Beyond questions of social cohesion and assimilation, the rapidly changing composition of the populations of the United States and Europe raises important questions about the future of the Transatlantic relationship. Their populations are not only becoming more diverse, they are becoming more different from each other. Will the United States feel the same affinity for Europe in the year 2050, when 24 percent (at least) of its population will be of Latin-American origin and another 8 percent will be of Asian origin? Will Europe feel the same affinity for the United States when a similar share of its population may be Muslim? The answer could have profound implications for the future geopolitical landscape.

Politics and National Direction

If you were to take a stroll through a European, Japanese, or American city in 2050, what would you notice? Silver-haired models adorning billboards, vendors selling large-print newspapers and magazines, the average pedestrian walking slower, and playgrounds for elderly—which already exist in Germany?⁸⁹ It will look and *feel* different. Businesses will no doubt adapt their products for the more abundant older consumers, giving the popular culture a more mature tone. Oscar Wilde once remarked that “youth is America’s oldest tradition.” What will become of America’s youth tradition when the ratio of senior citizens to college-age adults, which was 1-to-1 in 1940 and is already 2-to-1 today becomes 4-to-1 by mid-century?

The elderly will not only be a dominant cultural and social force, but a dominant economic force—due in large part to the huge share of national resources that will be steered toward them through public budgets. As we have seen, the cost of today’s “retirement deal” for public pensions and health benefits could rise to one-fifth of GDP in the United States by 2050, to more than one-quarter in Japan, and

⁸⁶ *Population Representation in the Military Services, Fiscal Year 2005* (Washington, DC: U. S. Office of the Assistant Secretary of Defense, Personnel and Readiness, 2006), <http://www.humrro.org/poprep/poprep05/index.html/>.

⁸⁷ Jodie Allen, “The French-Muslim Connection: Is France Doing a Better Job of Integration than Its Critics?” Pew Research Center, August 17, 2006, <http://pewresearch.org/pubs/50/the-french-muslim-connection/>.

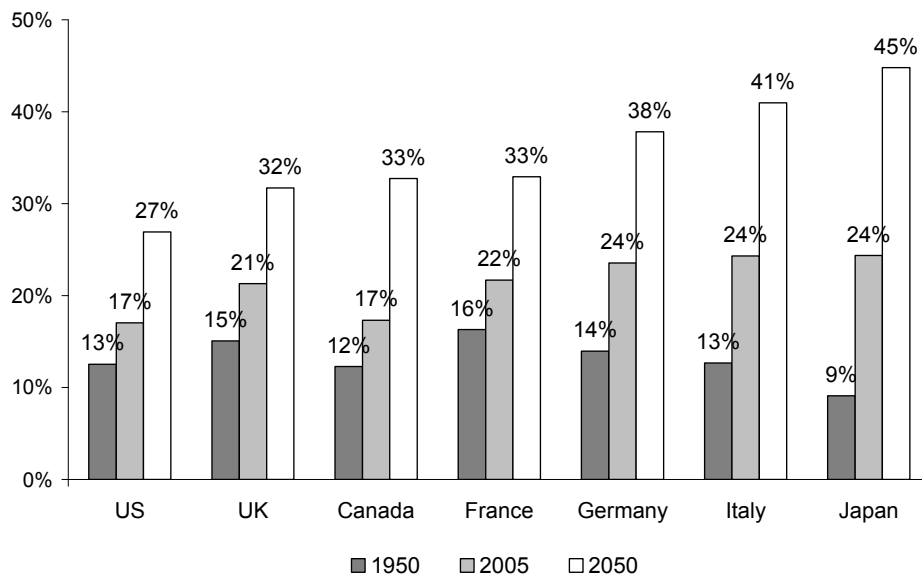
⁸⁸ Munira Mirza, Abi Senthilkumaran and Zein Ja’far, *Living Apart Together: British Muslims and the Paradox of Multiculturalism* (London: Policy Exchange, 2007).

⁸⁹ Jochen-Martin Gutsch, “Germany’s First Playground for Seniors,” *Speigel Online*, May 9, 2007.

to nearly one-third in Western Europe's major economies. To be sure, reforms have recently been legislated in a number of countries that are scheduled to reduce these income transfers from young to old. There is no assurance, however, that the reductions will happen.

In fact, whether or not they happen will be strongly influenced by whether the elderly allow them to happen. By 2050, 27 percent of the adult population in the United States will be aged 65 or over. Since the elderly vote with greater frequency than younger adults, their electoral clout will be further magnified. Given current U.S. voter participation rates, the elderly share of the actual voting electorate in mid-term congressional elections would be roughly 35 percent by mid-century. The elderly's dominance of the electorate will be even greater in faster-aging countries. By 2050, 38 percent of the adult population will be aged 65 and over in Germany, and in Japan the share will be a still loftier 45 percent. (See Figure 3-9.) If we take into account the fact that people begin looking forward to retirement well before age 65—and indeed, are often retired by then—the effective size of the “pensioner” vote is even larger.

Figure 3-9: Elderly (Aged 65 & Over) as a Percent of the Adult Population (Aged 20 & Over) in the G-7 Countries, 1950-2050



Source: *World Population Prospects* (UN, 2007).

If past trends are any indication, elderly resistance to benefit cuts may be intense. In the United States, a powerful senior lobby has arisen to protect (and expand) old-age entitlements. The AARP (formerly the American Association of Retired Persons), with a membership of 38 million and an annual budget of more than \$1 billion dollars, is probably the most influential interest group in the

country.⁹⁰ In Europe, pensioner interests are championed by labor unions and labor-linked political parties. Sometimes the unions themselves are dominated by pensioners. The CGIL, the largest union federation in Italy, has more pensioners than working members.⁹¹

Already today, government budgets in the developed countries are tilted heavily toward the old. In Europe, the ratio of per capita public benefit spending on the elderly to nonelderly ranges from 1.8-to-1 in Sweden at the low end to 5.0-to-1 in Italy at the high end. In the United States and Japan, the ratios are even more skewed: 6.2-to-1 and 6.9-to-1, respectively.⁹² In many developed countries, including the United States, the welfare state has become primarily a welfare state for the old.

At the same time, the economic experience of younger and older households is diverging. Since 1970, the real median income of U.S. households headed by adults aged 65 and over has grown by 71 percent, while that of households headed by adults aged 25 to 34 has grown by just 12 percent.⁹³ In Europe, meanwhile, expansive welfare states (whose rising cost discourages job creation) and overregulated labor markets (which favor older and unionized workers over younger workers) leave a large share of the rising generation with diminished economic prospects. Between 1985 and 2005, the EMU-wide youth unemployment rate has run between 17 percent and 29 percent.⁹⁴

All of this threatens to become worse as the developed countries age and the old-age benefit burden grows. Surveying the trends, Lester Thurow and Niall Ferguson have both predicted that age warfare could come to replace class warfare.⁹⁵ Although the developed countries are still far from this, it may yet come to pass.

Youth could respond to the downward pressure on their living standards in a variety of ways—one of which might be to have even fewer children. This would deepen the low-fertility trap and accelerate population aging. It might also widen the already large fertility gap between more secular and more religious families, since the decision of the latter to have children is more values-driven and may be less sensitive to income prospects. In both Europe and the United States, there is a strong positive correlation between fertility and degree of religious conviction.⁹⁶ A

⁹⁰ Jeffrey H. Birnbaum, "On Issues from Medicare to Medication, AARP's Money Will Be There," *The Washington Post*, April 24, 2007.

⁹¹ Tony Barber, "Italian Government Takes Notice of Older Workers," *AARP Global Report on Aging* (Spring 2005).

⁹² The figures refer to cash and in-kind benefits (at all levels of government) to households headed by adults over and under age 60. Calculations are based on Richard Jackson and Neil Howe, *The 2003 Aging Vulnerability Index: An Assessment of the Capacity of Twelve Developed Countries to Meet the Aging Challenge* (Washington, DC: CSIS and Watson Wyatt Worldwide, 2003).

⁹³ Historical Income Tables, U.S. Census Bureau, December 20, 2005, <http://www.census.gov/hhes/www/income/income.html/>.

⁹⁴ World Development Indicators 2007 (Washington, DC: The World Bank, 2007).

⁹⁵ Lester C. Thurow, "The Birth of a Revolutionary Class," *The New York Times Magazine*, May 19, 1996; and Niall Ferguson (Harvard University), interview by authors, November 18, 2007.

⁹⁶ Tomas Frejka and Charles Westoff, "Religion, Religiousness and Fertility in the U.S. and in Europe," MPIIDR Working Paper, no. WP 2006-013 (Rostock: Max Planck Institute for Demographic Research, May 2006).

glance around the United States, where the fertility rate in religious Utah (2.6) is 50 percent higher than in secular Vermont (1.7), suffices to confirm this.⁹⁷ Aging expert Phillip Longman worries that several generations of demographic self-selection by more fecund religious families could herald a “return of patriarchy” and imperil secular liberalism.⁹⁸ However that may be, we could see frequent values (and resource) clashes between disproportionately religious young families and disproportionately secular seniors.

Another response might be to emigrate—and indeed, we are already seeing this happening in Western Europe. From France and the UK to Germany and the Netherlands, the number of emigrants, most of whom are in their 20s and 30s, is now reaching levels not seen since the Great Migration of the mid-nineteenth to early twentieth centuries. In Germany in 2004, more people emigrated than in any year since 1884.⁹⁹ According to a 2005 survey of German university students, 52 percent would consider emigrating.¹⁰⁰ As a recent article in the *Financial Times* puts it, for many young Europeans the “future is another country.”¹⁰¹ This out-migration of native youth, a large share of whom are highly educated, will be a growing drain on Europe’s economies. Combined with the simultaneous in-migration of foreign-born minorities, it could also accelerate changes in the ethnic and religious composition of its population.

Among the young who remain, we may see a growing backlash against the old. In 2003, Philipp Missfelder, leader of Germany’s Christian Democrat youth wing, provoked a major controversy when he suggested in an interview with a leading German newspaper that 85-year-olds should start paying for their own false teeth and hip replacements.¹⁰² Although he was quickly muzzled by party elders, his remarks may offer a preview of an age-based politics to come.

The political competition between young and old could also become a competition between minority and majority populations. Hispanics make up just 7 percent of Americans aged 65 and over—but 20 percent of Americans under the age of 20. A similar age gap exists in Europe between Muslims and non-Muslims.¹⁰³ Pay-as-you-go welfare states that transfer resources from the young to the old depend not just on social solidarity, but on intergenerational solidarity. Young minority families may be less willing to pay a rising share of their incomes to support native-born elders with whom they have no personal connection—especially since many are doubly burdened by supporting their own parents in their

⁹⁷ *National Vital Statistics Reports* 54, no. 2 (Hyattsville, MD: National Center for Health Statistics, September 8, 2005).

⁹⁸ Phillip Longman, “The Return of Patriarchy,” *Foreign Policy*, no. 153 (March/April 2006); also see Eric Kaufmann, “Faith’s Comeback: How Demographics Will Reawaken Religion in Europe,” *Newsweek*, November 13, 2006.

⁹⁹ “Auf Wiedersen, Fatherland,” *Economist*, October 26, 2006.

¹⁰⁰ Cited in Paul Belien, “Emigration Nation; Europeans’ Flight From Europe,” *The Washington Times*, June 6, 2007.

¹⁰¹ Emma Jacobs, “The Future Is Another Country,” *Financial Times*, January 4, 2008.

¹⁰² Jack Ewing, “Germany Revolt of the Young,” *Business Week*, September 22, 2003.

¹⁰³ For the United States, see Current Population Survey, Annual Social and Economic Supplement, 2006, U.S. Census Bureau, http://pubdb3.census.gov/macro/032007/perinc/new03_000.htm; for Europe, see Savage, *op. cit.*

home countries through remittances. Meanwhile, native-born elders may feel less willing to pay for the public education of immigrant children.

The graying of the developed world's electorates could thus have consequences that are every bit as important—perhaps more important—than the graying of their economies. It may not lead to age warfare, but it will certainly tend to lock in current public spending priorities and make shifting resources to new priorities more difficult. More broadly, it could impart to public policy, including foreign policy, the same more cautious and risk-averse mood that demographic aging is likely to bring to the society at large. We know that extremely youthful societies are in some ways dysfunctional—prone to violence, instability, and state failure. Extremely aged societies may also prove to be dysfunctional in some ways as well—favoring consumption over investment, the past over the future, and the old over the young.

Chapter Four

THE DEVELOPING WORLD'S DEMOGRAPHIC FUTURE: CAUSE FOR HOPE OR CONCERN?

The developing world, like the developed world before it, is now in the midst of the demographic transition—the epochal shift from high mortality and high fertility to low mortality and low fertility that societies undergo in the course of development and modernization. The unfolding of this transition has shaped and will continue to shape the global security environment in profound ways.

When the transition got underway in the early postwar decades, the initial fall in mortality rates raised population growth to worrying heights, fueling fears of a global Malthusian crisis. Along the way, the large “youth bulges” that the transition created became a driving force behind social and political upheaval, from China’s Cultural Revolution starting in the late 1960s to the Muslim world’s radical Islamic movement starting in the late 1970s. But over time, as fertility too has fallen and youth bulges have matured into working-age bulges, the transition has also become a driving force behind economic growth, and perhaps a contributor to political stability, in some of the developing world’s most successful emerging markets.

The timing, pace, and progress of the transition varies greatly by region and nation. Since 1970, the average fertility rate in the developing world has dropped from 5.1 to 2.9, the rate of population growth has decelerated from 2.2 percent to 1.3 percent per year, and the median age has risen from 20 to 26. In some regions, the transition has progressed much faster and further. Below-replacement fertility, which until recently was limited to the developed world, has now spread to parts of the developing world as well, including virtually all of East Asia, Eastern Europe, and the Russian sphere. Compared with 5 percent in 1970, 34 percent of the developing world’s population (mostly in China) now lives in countries where fertility is either at or below the replacement level. In other regions, by contrast, the transition is still in its early stages. In sub-Saharan Africa, the average fertility rate is 5.6. Nearly half of the developing world’s population (46 percent) lives in countries where fertility remains higher than 3.0.

Notwithstanding this variety, some demographers, political scientists, and security experts believe that the unfolding of the transition is ushering in a new era in which demographic trends will promote global stability and push the world toward greater peace and prosperity. The “demographic peace” thesis, as we have dubbed it, begins with the observation that societies with rapidly growing

populations and young age structures are often mired in poverty and prone to civil violence and state failure, while those with no or slow population growth and older age structures tend to be more affluent and stable. As the demographic transition progresses—and population growth slows, median ages rise, and dependency ratios fall—the demographic peace thesis predicts that economic growth, social and political stability, and ultimately democracy will follow in the wake. Just as the spread of democracy fosters a democratic peace, so too will the demographic transition bring about a demographic peace.¹

We believe, to the contrary, that the developing world in the twenty-first century is likely to encounter powerful demographic forces that may be every bit as perilous as those that beset it in the twentieth. Indeed, the potential threats to global security are growing, not diminishing. The moment of maximum risk still lies ahead—just over a decade away in the 2020s. Ominously, this is the same decade that the developed world will itself be experiencing its moment of greatest demographic stress.

We define threats to include not just societies characterized by civil violence and political disorder (“failed states”), but also societies characterized in reaction by strong civil cohesion and undemocratic political order (“neo-authoritarian states”). We are, in other words, not talking just about a hostile version of the Somalia model, but also about a hostile version of the China or Russia model, which appears to have a growing appeal among political leaders from Libya and Iran to Venezuela and Vietnam.² We cannot discount the possibility that the transition will give rise to countries that are affluent, technologically advanced, civically cohesive—and antagonistic toward liberal democracy.

One problem with the demographic peace thesis is that it focuses exclusively on the first type of threat (chaotic state failure), which indeed tends to be closely and negatively correlated with the degree of demographic transition, while ignoring the second type of threat (neo-authoritarian state success), which is more likely to occur in societies in which the transition is well under way or recently completed. Failed states are dangerous because they breed discontent, undermine regional stability, and increase the risk of asymmetric conflict. But neo-authoritarian states may turn out to be even more dangerous if they give rise to new peer competitors and new conventional threats.

¹ The demographic peace thesis is most completely developed in studies by Population Action International. See Richard P. Cincotta, Robert Engelman, and Daniele Anastasion, *The Security Demographic: Population and Civil Conflict after the Cold War* (Washington, DC: Population Action International, 2003) and Elizabeth Leahy *et al.*, *The Shape of Things to Come: Why Age Structure Matters to a Safer, More Equitable World* (Washington, DC: Population Action International, 2007). Also see Richard P. Cincotta, “How Democracies Grow Up,” *Foreign Policy*, no. 165 (March/April 2008). The thesis is also subscribed to, in whole or in part, by a diverse group of demographers, political scientists, and security experts, some of whom we cite later in the chapter. Popular discussions of the future security environment have also begun to echo the demographic peace thesis. See, for instance, “Somewhere over the Rainbow,” *The Economist*, January 24, 2008.

² See, for instance, Azar Gat, “The Return of Authoritarian Great Powers,” *Foreign Affairs* 86, no. 4 (July/August 2007); Rowan Callick, “The China Model,” *The American: A Magazine of Ideas* 1, no. 7 (November/December 2007); and Afshin Molavi, “Buying Time in Tehran: Iran and the China Model,” *Foreign Affairs* 83, no. 6 (November/December 2004).

A more serious weakness of the demographic peace thesis is the absence of any realistic sense of historical process. Just because the present-day developed countries, which have completed the demographic transition, are relatively peaceful and democratic does *not* mean that today's developing countries, en route to completion, will become steadily more peaceful and democratic. Journeys can be much more dangerous than destinations. We have in fact only one major historical example of a large group of countries that have completed the entire demographic transition—the family of today's (mostly Western) developed nations. And their experience during that transition, from the late 1700s to the late 1900s, was filled with the most destructive revolutions, civil wars, total wars, and genocides in the history of civilization. The nations engaged in World War II had a higher average age and lower fertility rate—and thus were situated at a later stage of the demographic transition—than most of today's developing world is projected to have over the next 20 years. If demographic aging breeds peace, in other words, we are not out of the woods yet.

In the opening section of this chapter, we lay out our alternative perspective on the developing world's demographic transition and on its consequences for global security. We organize the discussion around the following five observations:

First, it has been well established that there is a broad correlation between youth and poverty on the one hand and chronic violence, social instability, and recurring civil war on the other. In the long term, the demographic transition should reduce these threats. Yet over the next several decades, the transition is expected to proceed very unevenly. In some crisis-wracked regions of the developing world, including virtually all of sub-Saharan Africa and parts of the Middle East and Central Asia, it is barely underway or has stalled in its early stages. In many countries where fertility has fallen and youth bulges are now receding, moreover, the transition will soon backtrack as populations in the volatile 15 to 24 age bracket once again surge in the 2020s—an “echo boom” that will be especially large in parts of the Muslim world.

Second, many of the most serious security threats, from international terrorism to neo-authoritarian reaction and consolidation, are in fact most likely to be posed not by the very youngest and poorest societies, but by societies that are part way through, or are just completing, their demographic transition. Because these societies are typically experiencing some degree of development and modernization, they are buffeted by disorienting economic, social, and cultural trends. When plotted against development, the trends describe an “inverted-U”—meaning they become most dangerous midway through the demographic transition. They include:

- contact with the global marketplace
- contact with global culture
- urbanization
- inequality in income and wealth
- international migration
- ethnic strife
- religious extremism
- environmental spoliation

Third, while it is possible that the demographic transition may trigger such rapid economic growth that a society quickly moves beyond the worst danger zone of violence, instability, and war, this rarely happens. In fact, it has only happened in the East Asian Tigers. Other parts of the developing world are failing to replicate the success of Singapore or South Korea. Most transitioning countries are lingering for decades at low and middle incomes. Many show no upward income trend at all.

Fourth, transitions that proceed too fast or too far may sooner or later be just as destabilizing as stalled transitions. China faces a massive age wave that will arrive in the 2020s while it is still in the midst of development, while Russia faces the prospect of population implosion. The social and economic stresses of rapid demographic aging will threaten to push them in an even more authoritarian direction.

Fifth, as transitioning countries lurch from accelerating to decelerating population growth, many ethnic groups feel numerically threatened by rivals. The result, exacerbated by a new emphasis on cultural and religious identity, is a new form of demographic competition. From Lebanon and Serbia to Nigeria and Pakistan, ethnic groups are vying for dominance in struggles that are increasingly shaped by fears of population growth or decline. Meanwhile, in the rapidly transitioning nations of East and South Asia, another kind of demographic competition has arisen at the family level—a preference for giving birth to boys over girls. The resulting gender imbalances will have ominous social and political consequences in the not-too-distant future.

After laying out our perspective on the demographic transition and its impact on global security, we then discuss the assumptions behind our projections and take the reader on a tour of the different regions of the developing world.

THE PERILS OF THE DEMOGRAPHIC TRANSITION

As the demographic transition unfolds, the countries of the developing world will undergo sometimes wrenching economic, social, and cultural adjustments. It is possible that when the transition has run its course, the global security environment that emerges will be safer than today's. It would be naive, however, to assume that the transition is making the security environment progressively safer along the way. In fact, for the next few decades, it is likely to make the environment more dangerous.

Stalled and Backtracking Transitions

In recent years, a growing body of research has established that countries with youthful populations are more prone to violent conflict, especially civil strife, than countries with older populations. The definitions of youth used by these studies vary, but the basic conclusion is the same. According to Henrik Urdal of the Centre for the Study of Civil War, “An increase of one percentage point in youth bulges,” defined as the number of young adults aged 15 to 24 as a share of all adults, “is associated with an increased likelihood of conflict of more than 4 percent.”³

³ Henrik Urdal, “A Clash of Generations? Youth Bulges and Political Violence,” *International Studies Quarterly* 50, no. 3 (2006), 617.

According to Population Action International, “Between 1970 and 1999, 80 percent of all civil conflicts that caused at least 25 deaths occurred in countries in which 60 percent or more of the population was under age 30. During the 1990s, countries with a very young structure were three times more likely to experience civil conflict than countries with a mature age structure.”⁴ Since the mid-1990s, long-term planners at the Pentagon and CIA have been tracking these “youth bulges” in order to predict emerging global hot spots.

Some experts expect that the security threats posed by overabundant youth will diminish as the transition progresses. Population Action International concludes that “Most countries are moving toward what we call here a *security demographic*, a distinctive range of population structures and dynamics that make civil conflict less likely.”⁵ French demographers Emmanuel Todd and Youssef Courbage predict that as the transition progresses and fertility converges globally at low levels, we will see a “rendez-vous” between civilizations.⁶ Thomas Barnett believes that the demographic trends in the Middle East mean that “time is on our side.”⁷ The assumption seems to be that if the worst of the youth threat isn’t already behind us, it soon will be.

This assumption may be badly mistaken. For one thing, the progress of the transition is highly uneven—and in some parts of the developing world it is progressing slowly or not progressing at all. In sub-Saharan Africa, fertility has fallen only slightly, from 6.8 in the late 1970s to 5.6 today. Youth aged 15 to 24 now make up 36 percent of all adults aged 15 and over, the largest youth bulge share of any region in the world. Between 2005 and 2030, this share will decline only marginally to 34 percent. By comparison, the developed world’s youth bulge share is now 16 percent and is due to fall to 13 percent. Elsewhere in the developing world, to be sure, regional youth bulge shares are projected to decline substantially—and in East Asia, Eastern Europe, and the Russian sphere they have already fallen to developed world levels or will soon do so. (See Figure 4-1.) Regional averages, however, can be deceptive. The transition has failed to gain traction in parts of the Arab world and non-Arab Muslim Asia, including such chronically unstable countries as Afghanistan, Iraq, the Palestinian Territories, Somalia, Sudan, and Yemen. Here fertility rates still tower in the 4-to-7 range—and youth bulge shares will remain at or near sub-Saharan African levels for the next few decades. Some Latin American and South Asian Countries, including Guatemala, Haiti, Nepal, Cambodia, and Laos, will also have large and lingering youth bulges.

Nor are countries where the transition is progressing slowly the only ones where youth populations will remain a destabilizing force. It is entirely possible for the number of youth to be growing rapidly even as youth bulge shares are flat or

⁴ Leahy *et al.*, *op. cit.*, 10.

⁵ Cincotta, Engelman, and Anastasion, *op. cit.*, 14.

⁶ Emmanuel Todd, *The Breakdown of the American Order: After the Empire* (New York: Columbia University Press, 2003) and Emmanuel Todd and Youssef Courbage, *Les rendez-vous des civilisations* (Paris: Le Seuil, 2007).

⁷ Thomas P. M. Barnett, *Blueprint for Action: A Future Worth Creating* (New York: Berkley Books, 2005), 90.

declining. Many developing countries where fertility has fallen dramatically over the past few decades and youth bulges are now receding will see a huge new youth surge in the 2020s.

Figure 4-1: Youth Bulge (Aged 15-24), as a Percent of Adult Population (Aged 15 & Over), 2005-2050

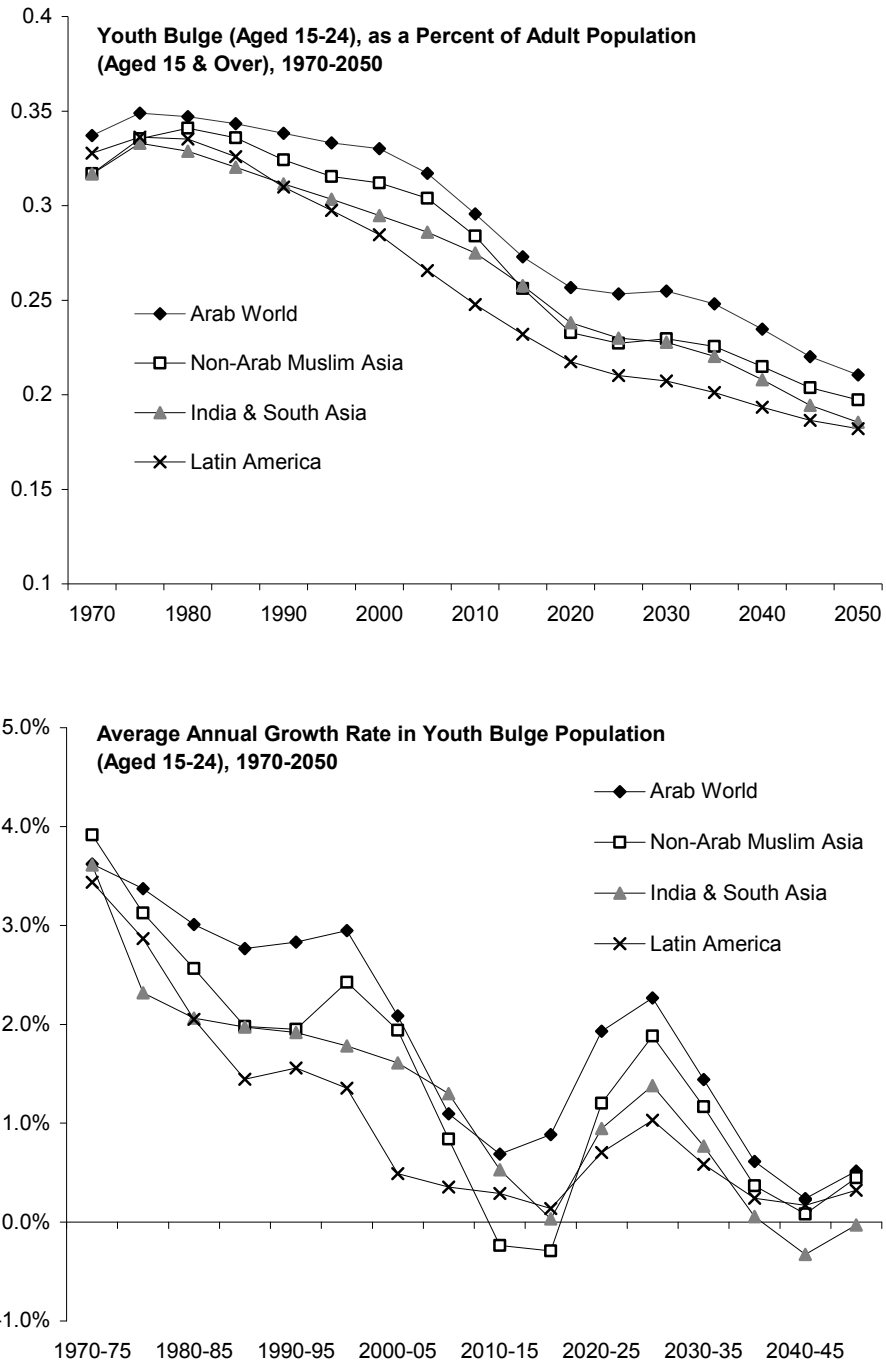
	2005	2030	2050
Developing World	27%	22%	19%
Sub-Saharan Africa	36%	34%	28%
Arab World	32%	25%	21%
Non-Arab Muslim Asia	30%	23%	20%
China & East Asia	21%	14%	11%
India & South Asia	29%	23%	19%
Latin America	27%	21%	18%
Russian Sphere	20%	13%	10%
Eastern Europe	18%	12%	9%
Developed World	15%	13%	13%

Source: *World Population Prospects* (UN, 2007).

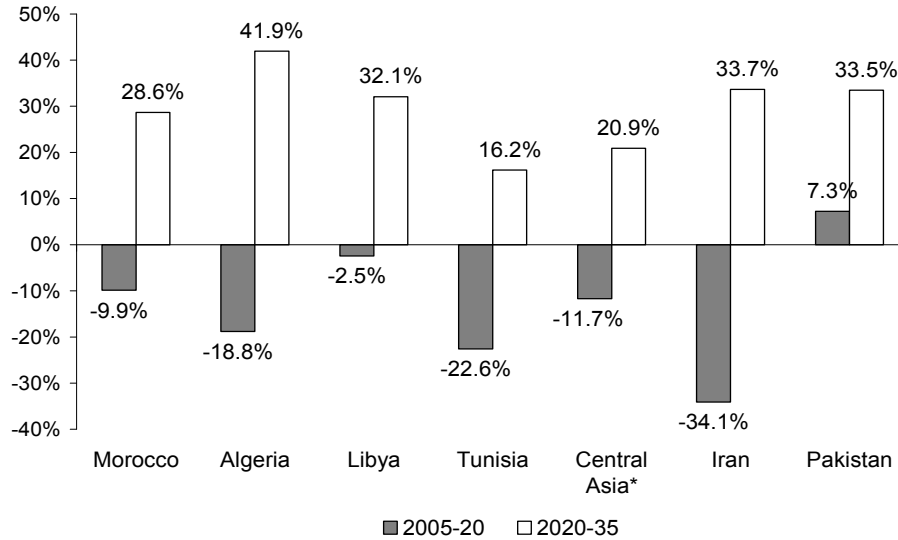
This brings us to a crucial point largely overlooked by the literature on demographics and security—namely, the nonlinearity of the transition’s impact on population growth and age structure. The coming youth surge is an aftershock of the demographic transition’s initial population boom. This follows from a phenomenon known as Sundt’s Law: When a population boom is followed by a population bust, it causes a ripple effect, with a gradually fading cycle of echo booms and busts that recurs every 20 to 25 years. Over the next decade, a bust generation will be coming of age in much of Latin America, South Asia, the Arab world, and non-Arab Muslim Asia. But by the 2020s, a large echo boom generation—that is, the children of the original boom generation—will follow. As it does, the growth rate in youth populations, which is now slowing in all of these regions, will suddenly reverse direction. (See Figure 4-2.) This reversal will be especially dramatic in some Muslim countries. In the Arab world, the growth rate in youth aged 15 to 24 will slow from 2.6 percent per year between 1990 and 2005 to 0.9 percent between 2005 and 2020, then accelerate to 1.9 percent per year between 2020 and 2035. In non-Arab Muslim Asia, it will slow from 2.1 percent per year to 0.1 percent, then accelerate to 1.4 percent per year.

The echo booms of the 2020s will be largest in precisely those countries where fertility has fallen the fastest over the past 20 to 25 years and youth populations are now declining most rapidly. In Iran, whose fertility rate plunged from 6.6 in 1980 to 2.1 in 2005, the number of 15 to 24 year olds will shrink by 34 percent between 2005 and 2020. Between 2020 and 2035, however, the number will again swell by 34 percent. Many other Muslim countries, from Libya to Pakistan, will also experience huge oscillations in their youth populations. (See Figure 4-3) While stalled transitions threaten to mire some of the world’s poorest countries indefinitely in

Figure 4-2: Youth Bulges: Population Shares vs. Growth Rates



Source: *World Population Prospects* (UN, 2007).

Figure 4-3: Cumulative Percentage Change in the Youth Bulge Population (Aged 15-24), by Time Period

*Includes Azerbaijan, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan.
 Source: Based on *World Population Prospects* (UN, 2007).

what Thomas Barnett calls the “non-integrating gap,” nonlinear transitions could push other faster-developing countries back into it.

The demographics and security literature, which focuses on changes in youth bulge shares rather than changes in the relative size of successive youth cohorts, fails to take this echo boom dynamic into account. Yet it is the growth in the number of youth, cohort over cohort, that may ultimately matter most for stability and security. The sudden emergence of large youth cohorts can stress economic and social institutions, from school systems to job markets to housing markets—as the postwar baby boom famously did in the United States. They may also fare poorly economically to the extent that their numbers depress wages or asset prices.⁸ The echo booms of the 2020s will be occurring in countries whose social fabric is already being strained by rapid development and modernization. Unless much changes, the echo boom generation could become an even more aggrieved and threatening force than their parents.

“More Murder in the Middle”

It is often asserted as a truism that economic development reduces the risk of conflict. As former UN Secretary General Kofi Annan recently observed, “There will be no development without security and no security without development.”⁹

⁸ This is commonly known as the Easterlin Hypothesis. See Richard A. Easterlin, *Birth and Fortune: The Impact of Numbers on Personal Welfare* (New York: Basic Books, 1980); and Diane J. Macunovich, *Birth Quake: The Baby Boom and Its Aftershocks* (Chicago: University of Chicago Press, 2002).

⁹ Quoted in Leahy *et al.*, *op. cit.*, 8.

While this may be true as a long-term proposition, the relationship between the two is not linear. In fact, researchers are now finding that many types of security threats actually describe a hump-shaped curve or “inverted-U” that initially rises along with economic and social development, whose speed and timing themselves closely track the demographic transition in most countries. In other words, the most serious security threats are posed neither by the very youngest and poorest countries nor by the very oldest and richest, but rather by countries that are in the midst of the transition and the midst of development.

There is considerable evidence for a hump-shaped relationship between development and armed conflict in general. Looking at data on all armed conflicts between 1946 and 2006, the Center for Systemic Peace finds a clear inverted-U pattern. “Countries in the second [income] quintile experience the highest magnitudes of warfare throughout the period. This may be explained simply by pointing out that they have more capacity than countries in the bottom quintile to make war but less capacity than the upper quintiles to manage conflict.”¹⁰ A number of other studies, using various methodologies and covering different time periods, reach a similar conclusion.¹¹ Meanwhile, Population Action International, looking at civil conflicts alone, finds that the positive correlation between youthful age structures and conflict has strengthened from decade to decade between 1970 and 2000. The likelihood of conflict, moreover, has increased most not for the very youngest countries, but for those that are part way through the transition—a finding that is almost certainly explained by their more rapid economic and social development.¹²

This hump-shaped relationship appears even stronger for the most serious types of security risks. Academic scholarship confirms what even the most casual review of twentieth-century history suggests: The threats of interstate war, social revolution, and genocide peak late in the transition.¹³ It is also well documented that international terrorism, among the developing countries, is positively correlated with income, education, and urbanization.¹⁴ States that sponsor terrorism are rarely among the poorest countries; nor do the terrorists themselves usually originate in the poorest countries. Indeed, they are often disaffected members of the middle class in middle-income countries—as confirmed in remarkable detail by the recently discovered recruitment records of 606 foreign fighters who joined al-Qaeda in Iraq

¹⁰ “Measuring Systemic Peace,” Center for Systemic Peace, October 25, 2007, <http://www.systemicpeace.org/conflict.htm/>.

¹¹ See Demet Yalcin Mousseau, “Democratizing with Ethnic Divisions: A Source of Conflict?” *Journal of Peace Research* 38, no. 5 (September 2001); and Håvard Hegre *et al.*, “Toward a Democratic Civil Peace? Democracy, Political Change, and Civil War, 1816-1992,” *The American Political Science Review* 95, no. 1. (March 2001).

¹² Leahy *et al.*, *op. cit.*

¹³ See William Easterly, Roberta Gatti, and Sergio Kurlat, “Development, Democracy, and Mass Killings,” Working Paper no. 93 (Washington, DC: Center for Global Development, August 2006).

¹⁴ See, for instance, Michael Mousseau, “Market Civilization and Its Clash with Terror,” *International Security* 27, no. 3 (Winter 2002/03); Alan B. Krueger and Jitka Maleckova, “The Economics and Education of Suicide Bombers: Does Poverty Cause Terrorism?” *The New Republic*, June 24, 2003; and Alan B. Krueger, “What Makes a Terrorist,” *The American: A Magazine of Ideas* 1, no. 7 (November/December 2007).

between August 2006 and August 2007.¹⁵ This hump-shaped relationship is perhaps the strongest of all when it comes to neo-authoritarian consolidation and reaction, which is a far greater threat in rapidly developing Iran, Russia, or China than it is in sub-Saharan Africa.

None of this should be surprising given what we know about development. Economists, sociologists, and historians who have studied the development process agree that societies undergo tremendous economic, social, and cultural stress as they move from the traditional to the modern. When plotted against development, most of the stressors themselves describe an “inverted-U”—meaning that they become most dangerous midway through the transition. Among the most important stressors are:

- *Contact with the global marketplace.* Development takes societies with large rural population shares, high rates of poverty, traditional social structures, and widespread reliance on nonmarket exchange and exposes them to the forces of the global marketplace. Rates of poverty may fall and living standards may rise, but the economic and social adjustments are often wrenching. Development monetizes the economy, replacing subsistence agriculture and family-based employment with wage labor. It uproots and urbanizes rural populations. And it weakens the informal community and extended-family support networks that constitute the social safety net in traditional societies—without, initially, putting anything in their place. In the history of the West, this process fueled widespread social unrest that erupted many times in riots, uprisings, and social revolutions.
- *Contact with global culture.* Along with contact with the global marketplace comes contact with the global culture—that is to say, with contemporary Western culture in all of its guises. There is the materialism and hedonism of the West’s popular culture, which is marketed by global corporations, broadcast by the mass media, and streamed over the Internet. But there are also the ideals of individual self-determination, secularism, and democracy, which can be even more subversive of traditional cultural norms. Expectations regarding everything from the authority of elders to the social role of women to the place of religion in public life are thrown into question. The process of development and modernization is not just economically and socially disruptive, but culturally disorienting.
- *Urbanization.* As recently as 1980, just 33 percent of the developing world’s population lived in cities. Today 44 percent do, and that share will reach 57 percent by 2030.¹⁶ Of the 20 megacities in the world with populations greater than 10 million, 16 of them are in developing countries. Urbanization is sometimes driven by a push from the countryside (overpopulation and

¹⁵ See Karen DeYoung, “Papers Paint New Portrait of Iraq’s Foreign Insurgents,” *Washington Post*, January 21, 2008.

¹⁶ Historical data and projections are from *World Urbanization Prospects: The 2005 Revision* (New York: UN Population Division, 2006), adjusted to CSIS regional definitions.

environmental degradation), but more often by a pull from the cities (economic opportunities). Either way, it accelerates the erosion of traditional social structures by breaking up tight-knit rural communities, fragmenting extended families, and exposing migrants to all the social and cultural cross-currents of modernity. Developing-world cities typically have larger youth bulge shares than the population as a whole, since it is the young who are most likely to migrate. Many also have high rates of youth unemployment, inadequate health and social services, and vast and growing slums. Overall, roughly two-fifths of the developing world's total urban population lives in slums.¹⁷

Although armed insurgencies in developing countries often begin in the countryside, it is urban centers that usually give rise to gang warfare, political demonstrations and riots, radical religious movements, terrorism, and social revolutions. The stresses of urbanization are most likely to erupt in violence where governments are ineffective, economic growth is slow, and economic aspirations are disappointed. According to the State Failure Task Force, sub-Saharan African countries with above-average levels of urbanization and below-average levels of per capita GDP were almost twice as likely to experience a political crisis between 1955 and 1995 as other countries in the region.¹⁸ But rapid urbanization is potentially destabilizing in any country experiencing large-scale rural-urban migration. In China, roughly 150 million peasants have already left the countryside for the boom towns of China's industrial revolution—and the government projects that this “floating population,” which is far poorer, less educated, and less likely to be covered by the social safety net than native-born city-dwellers, will grow by *another* 300 million over the next two decades.¹⁹

- *Inequality in income and wealth.* Perhaps the most durable explanation of how inequality shifts over time is the “Kuznets Inverted-U-Curve” hypothesis, named after economist Simon Kuznets, who suggested a half-century ago that inequality almost everywhere seems to move through distinct historical stages: It is low in traditional societies, rises rapidly with the onset of economic growth, then levels off and eventually falls as societies become capable of mass affluence.²⁰ Growing inequality, as distinct from poverty, can be a socially disruptive force—and inequality is now growing in much of the developing world, perhaps most dramatically in China. According to many social scientists, people's well-being depends not just on their absolute income, but on their income *relative* to others in their community or “reference group.” As inequality grows, some segments of the population experience intense feelings of “relative deprivation” that can provoke violent social and political backlash. This dynamic is further fueled by growing

¹⁷ *State of the World's Cities 2006/2007* (Nairobi: UN-HABITAT, 2006).

¹⁸ Cited in Jack A. Goldstone, “Population and Security: How Demographic Change Can Lead to Violent Conflict,” *Journal of International Affairs* 56, no. 1 (Fall 2002).

¹⁹ “China Sees Soaring Migration Population,” Xinhua News Agency, October 29, 2006; and “300 Million Chinese Farmers to Move into Cities in Next 20 Years,” Xinhua News Agency, January 12, 2007.

²⁰ Simon Kuznets, “Economic Growth and Income Inequality,” *American Economic Review* 45, no. 1 (1955).

mobility, urbanization, and exposure to the mass media, all of which make people more acutely sensitive to differences in relative living standards. It helps to explain why most of history's great social upheavals have occurred not in static agrarian societies, but in societies (like France in 1789 or Russia in 1917) where incomes—and inequality—were growing rapidly.

- *International migration.* Many policymakers assume that development will decrease immigration pressure—which is one reason why the United States signed NAFTA and why many European countries spend so heavily on development aid to North Africa and the Middle East. But in fact, it is well established that international migration is a hump-shaped phenomenon, and that the impact of development depends on whether countries are on the left or right side of the migration hump.²¹ The world's least developed countries produce only a tiny fraction of all international migrants. Emigration rates climb rapidly as countries develop—in part because rising incomes lift the “poverty constraint” on emigration, and in part because of the less tangible social and cultural changes triggered by development, from familiarity with markets and urban lifestyles to contact with the global media, which make people more predisposed to migrate. As immigration expert Douglas Massey puts it, “International out-migration does not stem from lack of economic development, but from development itself.”²² Only when wages in origin countries begin to catch up with those in destination countries do rates of emigration eventually peak and begin to fall, as they have recently done in South Korea.

Most of the developing world still clearly lies on the left side of the migration hump, which means that immigration pressure is likely to grow, not abate. Large-scale immigration generates social stresses—and not just in the destination countries. “Brain drains” are now damaging economic growth prospects in many parts of the developing world, from sub-Saharan Africa to Latin America. Remittances may lift millions out of poverty, but as they do so they also increase income inequality. Besides sending money home to their families, diaspora communities can also help fund conflicts in their origin countries, as has happened in Armenia and Sri Lanka. To be sure, emigration also acts as a stabilizing force by offering an escape valve for people who cannot fulfill their economic aspirations at home. But here too there is a risk—namely, that the current swing toward greater immigration restriction in the developed countries will gather momentum. If immigration flows are curtailed, countries from Mexico to Morocco, which have so far managed to navigate the development process without a major social upheaval, may find themselves confronting new stresses.

- *Ethnic strife.* There also appears to be a strong hump-shaped relationship between ethnic strife and development. Part of the explanation is that, in most

²¹ See Neil Howe and Richard Jackson, *Long-Term Immigration Projection Methods: Current Practice and How to Improve It* (Washington, DC: CSIS, 2006).

²² Douglas S. Massey, “Building a Comprehensive Model of International Migration” (paper prepared as part of the CSIS Project on Long-Term Immigration Projections, January 2006), 10.

societies, some ethnic groups are more successful in the marketplace than others, among the best known examples being the Chinese in Southeast Asia, the Russians in Central Asia, and the Arabs and Indians in sub-Saharan Africa. As development accelerates and the market economy grows, rising inequality often falls along ethnic lines. In *World on Fire*, Amy Chua documents how the concentration of wealth among “market-dominant minorities” has triggered violent backlashes by majority populations in many developing countries, from Indonesia, Malaysia, and the Philippines (against the Chinese) to Sierra Leone (against the Lebanese) to the former Yugoslavia (against the Croats and Slovenes). The likelihood of conflict, ironically, grows not just with development, but with democratization. As Chua observes, the sudden political empowerment of poor, disenfranchised majorities can give rise to “powerful ethnonationalist, anti-market pressures and routinely results in confiscation, instability, authoritarian backlash, and violence.”²³

- *Religious extremism.* Looking back over the history of awakenings, anthropologist Anthony Wallace long ago noted that cultural and religious “revitalization movements” almost always occur in periods of rapid social and cultural change and psychological stress.²⁴ Many in the West suppose that the appeal of radical Islam will diminish as development reduces poverty, raises educational attainment, and integrates societies into the global marketplace. But in fact, like the surging growth of fundamentalist Christianity in sub-Saharan Africa, Latin America, and East Asia, the rise of radical Islam is in part a reaction to development. Religious and cultural revitalization movements help to fill the void that is left behind as development uproots communities and fragments extended families. They can substitute for dysfunctional governments by providing not just spiritual support, but vital social services—as does Hezbollah in Lebanon, the Muslim Brotherhood in Egypt, and the Mahdi Army in Iraq. Perhaps most importantly, they reaffirm traditional cultural identities that are threatened by modernization—which is to say, the onslaught of Western values. In the case of radical Islam, with its calls for global jihad, the backlash has of course led to violent confrontation with the West. The forces fueling the reaction will not necessarily abate—and indeed may intensify—as the transition progresses.
- *Environmental spoliation.* Although many poor and overpopulated countries in the developing world face acute environmental stress—including degradation of agricultural land, deforestation, and water shortages—it is widely agreed that the environmental footprint a society makes depends more on the growth in per capita consumption than the growth in population size. Like inequality and migration, environmental spoliation exhibits a hump-shaped relationship to development—rising steeply at first, then leveling off and ultimately falling as societies become affluent. Many of the world’s most rapidly developing economies are also among its most environmentally challenged—from China,

²³ Amy Chua, *World on Fire: How Exporting Free Market Democracy Breeds Ethnic Hatred and Global Instability* (New York: Doubleday, 2003), 16.

²⁴ Anthony Wallace, “Revitalization Movements,” *American Anthropologist* 58 (1956).

which has 16 of the world's 20 most polluted cities; to Brazil, where the Amazon rainforest is disappearing at the rate of 20 square miles per day; to India, where the share of the population facing "water stress" is projected to rise to three-quarters by 2025 from zero today.²⁵ As Jared Diamond documents in *Collapse*, environmental spoliation has contributed to the decline of many of history's great civilizations, from the Roman to the Mayan.²⁶ Whether or not it leads to similar catastrophes in the future, it is sure to generate increasing economic, social, and political stress.

As the first decade of the twenty-first century draws to a close, there are very few entirely traditional developing countries left in the world. Yet there are also very few developing countries that have entirely completed the journey from traditional to modern. Most of the developing world lies midway through the demographic transition and mid-way through the development process. In most countries, moreover, this process promises to be protracted. Only a handful of countries, including the East Asian Tigers and some of the Eastern European states now being integrated into the EU, are clearly beyond the danger zone where development increases security risks.

To be sure, the number of conflicts in the world rises and falls in different decades for a wide variety of reasons that may have little to do with the pace of economic and social development. Over the past 10 years, the number of conflicts has fallen.²⁷ Nonetheless, the inverted-U will continue to be an important driver of conflict—and most of the developing world will remain within the danger zone for decades to come.

The stresses of the transition and of development help to explain the fragility of new democracies. When social scientists sort regimes by likelihood of violent conflict, which type do they find is most at risk? Not traditional autocratic regimes, virtually all of which are found in societies at the beginning of the transition. And not fully developed liberal democracies, virtually all of which are found in societies where the transition has long since been completed. Rather, it is semi-democracies or "anocracies," virtually all of which are found in societies that are in the midst of the transition and the midst of development. Much research confirms that the frequency and intensity of state-organized violence exhibits an inverted-U relationship to regime type, with "more murder in the middle—between liberal democracy and absolutism."²⁸ Political scientist Ian Bremmer calls this the "J Curve"—the tendency of openness and democracy to make states less stable before it makes them more stable.²⁹ As Samuel Huntington observes, "The primary

²⁵For "water stress" projections, see People in the Balance: Interactive Database, Population Action International, 2006, <http://www.populationaction.org/>.

²⁶Jared Diamond, *Collapse: How Societies Choose to Fail or Succeed* (New York: Viking, 2004).

²⁷J. Joseph Hewitt, Jonathan Wilkenfeld, and Ted Robert Gurr, *Peace and Conflict 2008* (London: Paradigm Publishers, 2008).

²⁸Helen Fein, "More Murder in the Middle: Life-Integrity Violations and Democracy in the World, 1987," *Human Rights Quarterly* 17, no. 1 (February 1995). See also Hegre *et al.*, *op. cit.*; and Easterly, Gatti, and Kurlat, *op. cit.*

²⁹Ian Bremmer, *The J Curve: A New Way to Understand Why Nations Rise and Fall* (Simon & Schuster, 2006).

problem of politics is the lag in the development of political institutions behind social and economic change.”³⁰

These stresses also help to explain the rise of the neo-authoritarian state. Neo-authoritarianism has a twofold appeal in rapidly developing societies. One appeal is its reputation—and some say its actual recent track record—in promoting economic growth better than democracies (the upside of development).³¹ The other appeal is as a means of staving off the chaos that can be unleashed by rapid demographic, social, and cultural change (the downside). To be sure, some developing countries have managed to establish stable liberal democracies. But many of these had strong ties to the West, whether through common culture (for instance, Hungary or the Czech Republic) or their colonial past (for instance, India). Many, moreover, embraced decidedly authoritarian regimes during their period of most rapid development, as did all of the East Asian Tigers. In countries where democratic institutions have shallow roots or no roots at all, governments may well conclude that the China model is the only alternative to social and political turmoil. In this sense, neo-authoritarianism is an organic outgrowth of the threat of state failure.

Any realistic assessment of future geopolitical threats must acknowledge that the greatest dangers to security over the next few decades lie not in very young countries, but in countries where the transition is well underway. While sub-Saharan Africa may still be wracked by youth bulges and prey to endemic violence, it is not a big geopolitical concern. What we most worry about are large and rapidly developing countries that could either slip into chaos—or else become affluent, technologically advanced, and civically cohesive, yet hostile to liberal democracy. State failure in an Iran or Pakistan, much less a Russia or China, would have far more dangerous regional and global consequences than state failure in a Somalia or Sierra Leone. By the same token, so would the consolidation of regimes that are both neo-authoritarian and economically fully developed. All of the most potentially threatening states in the world today occupy an unstable middle ground—even North Korea, which, though by no means rapidly developing, is neither young and prone to youth violence nor old, wealthy, and democratic.

None of this is to say that chaotic collapse or neo-authoritarian consolidation are the only two alternatives. Some of the countries that seem most at risk today may ultimately manage to skirt both dangers and emerge fully developed, stable, and liberal members of the world community. Nonetheless, it is revealing that when we think about the two kinds of threats, both outcomes often seem equally plausible. We may worry more about chaotic collapse in some cases and neo-authoritarian consolidation in others. But the balance in many countries could tip either way. Consider Russia, which a decade ago was slipping into chaos, but is now veering toward neo-authoritarianism.

³⁰ Samuel P. Huntington, “Political Order in Changing Societies,” in *The Globalization and Development Reader: Perspectives on Development*, eds. J. Timmons Roberts and Amy Bellone Hite (Malden, MA: Blackwell, 2007), 60.

³¹ Kevin Hassett, “Does Economic Success Require Democracy?” *The American* (May/June 2007).

Squandered Demographic Dividends

To the extent that the transition gives rise to rapid economic growth, it may help countries move more quickly up and over the development hump and out of the transition's most dangerous phase. East Asia, where the transition has proceeded fastest and furthest, has experienced an extraordinary and sustained burst of economic growth over the past several decades, and is now rapidly closing the living standard gap with the developed world. For a long time, development economists, looking at the stunning rise of East Asia, assumed that other regions would soon follow suit. But these hopes have been largely dashed. Vast areas of the developing world today are already much further through the transition than the East Asian Tigers were when their economic miracles took off in the mid-1960s or than China was when it began its rags-to-riches rise in the late 1970s. Yet very few countries are replicating East Asia's success.

There is little question that the transition can help to promote economic growth as it progresses. When the transition first begins, the growth in the number of young dependents outpaces the growth in the working-age population, which tends to pull down per capita living standards. But as the transition progresses and fertility falls, the dependency burden declines and the share of the population in the working ages rises, which tends to push per capita living standards up. Falling dependency ratios, together with rising longevity, can also increase living standard growth by raising savings rates, encouraging investment in human capital, and freeing up adult time, especially the time of women, for participation in the market economy. The favorable demographics of this second phase of the transition are sometimes referred to as the "demographic dividend"—and they open up a window of opportunity for countries to boost economic growth.

Economists who have studied the transition agree that East Asia's unusually large demographic dividend has underpinned its economic rise. Since 1975, the total dependency ratio of children and elderly to working-age adults has fallen from 114 to 61, the largest drop of any region in the world. Meanwhile, the share of the population in the working years has risen from 47 to 62 percent. (See Figure 4-4.) Most studies conclude that between one-quarter and two-fifths of the growth in per capita GDP in East Asia since the mid-1970s is attributable to the dramatic shift in the age structure of its population.³²

Yet if favorable demographics guaranteed economic success, most of the developing world would be growing as fast, or nearly as fast, as East Asia. Dependency ratios have been falling and the working-age share of the population rising in every region of the developing world since the mid-1970s, the only exception being sub-Saharan Africa. In Latin America, the dependency ratio fell from 128 to 84 between 1975 and 2005, a drop that in percentage terms is three-

³² See, for instance, David Bloom and Jeffrey Williamson, "Demographic Transitions and Economic Miracles in Emerging Asia," *World Bank Economic Review* 12, no. 3 (September 1998); David Bloom, David Canning, and Pia Malaney, "Demographic Change and Economic Growth in Asia," *Population and Development Review* 26, suppl. (2000); and Jeffrey Williamson, "Demographic Change, Economic Growth, and Inequality," in *Population Matters: Demographic Change, Economic Growth, and Poverty in the Developing World*, eds. Nancy Birdsall, Allen C. Kelley, and Steven Sinding (New York: Oxford University Press, 2001).

Figure 4-4: Total Dependency Ratio and Working-Age Population (Aged 20-64), as a Percent of Total Population in 1975 and 2005

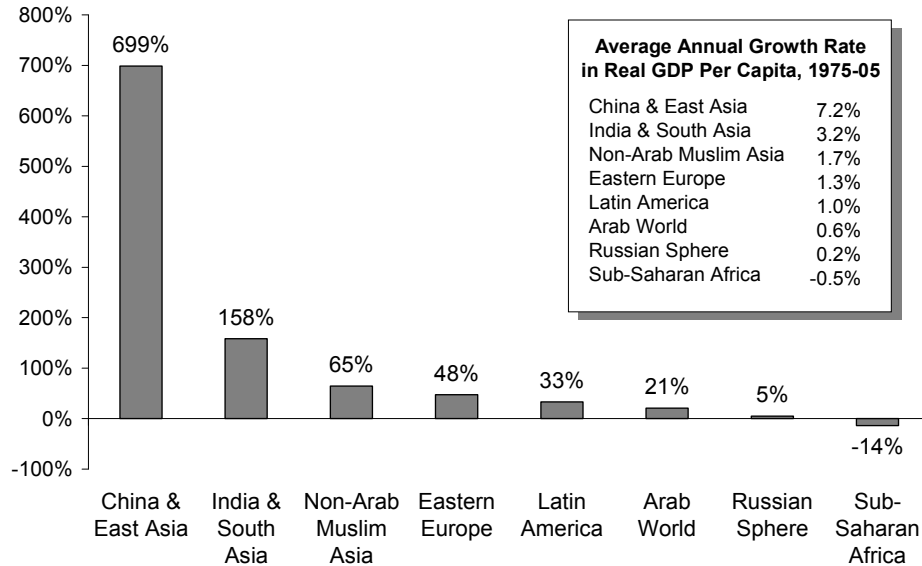
	Total Dependency Ratio		Working-Age Population	
	1975	2005	1975	2005
Sub-Saharan Africa	140	136	42%	42%
Arab World	143	100	41%	50%
Non-Arab Muslim Asia	131	91	43%	52%
China & East Asia	114	61	47%	62%
India & South Asia	121	91	45%	52%
Latin America	128	84	44%	54%
Russian Sphere	73	61	58%	62%
Eastern Europe	76	61	57%	62%

Source: *World Population Prospects* (UN, 2007).

quarters as large as the decline East Asia experienced over the same period. Yet per capita GDP in Latin America has grown at just one-seventh of the rate in East Asia—1.0 percent per year versus 7.2 percent since 1975. While living standards in East Asia have risen by roughly 700 percent since 1975, in Latin America they have risen by just 33 percent. (See Figure 4-5.) According to one study, East Asia's larger demographic dividend accounts for only 11 percent of the difference in per capita GDP growth rates between the two regions.³³ The rest is due to differences in the broader economic, social, and cultural environment that have helped growth in East Asia but hurt it in Latin America. The Arab world, non-Arab Muslim Asia, and South Asia have also experienced large declines in their dependency ratios since the mid-1970s—and dependency ratios in Eastern Europe and the Russian sphere, which were already low, have fallen even further. Yet no region has achieved sustained growth rates in per capita living standards that even approach East Asia's level.

To be sure, economic performance in most of the developing world has improved markedly since the mid-1990s. A record number of countries are now experiencing at least modest growth in per capita incomes, and in most of South Asia, Eastern Europe, and the Russian sphere, incomes are rising rapidly. This is a big improvement over the 1980s and early 1990s, when some regions of the developing world actually registered large absolute declines in real living standards. Yet despite the recent improvements, most of the developing world is still failing to close the income gap with the developed world. Since 1975, per capita incomes in East Asia have risen dramatically relative to the developed-world average—from 4 percent to 15 percent for the entire region including China and from 26 percent to 72 percent for the Tigers alone. South Asia has also gained ground, though at a much slower pace. In every other region of the developing world, the gap in living

³³ David Bloom, David Canning, and Jaypee Sevilla, *The Demographic Dividend: A New Perspective on the Economic Consequences of Population Change* (Santa Monica, CA: RAND Corporation, 2003).

Figure 4-5: Cumulative Percentage Change in Real GDP Per Capita (in 2005 PPP Dollars), 1975-2005

Source: *World Development Indicators* (Washington, DC: World Bank, 2007); and authors' calculations.

standards is actually *larger* today than it was in 1975—and though the countries of Eastern Europe and the Russian sphere are now narrowing the gap, Latin America, the Arab world, non-Arab Muslim Asia, and sub-Saharan Africa are not. (See Figure 4-6.)

East Asia's economic success, in short, may be more the exception than the rule. It depended not just on favorable demographics, but on stable and effective governments capable of pursuing a long-term strategy of export-led growth—a model pioneered by “Japan, Inc.” in the 1950s and 1960s and successfully copied by South Korea, Hong Kong, Taiwan, Singapore, and now China. To varying degrees in different countries, it also depended on sound macroeconomic policies, pro-business tax and regulatory regimes, public confidence in the rule of law, and massive public investments in human capital. South Korea, which as recently as the 1960s was a poor and largely illiterate nation of peasant farmers, now has the highest high school graduation rate in the world—and among the highest college graduation rates. Another crucial element may have been the region's Confucian culture, with its stress on hard work, filial piety, and social order—what former Singapore Prime Minister Lee Kuan Yew calls “Asian values.”³⁴ The bottom line is that the conditions that have allowed East Asia to leverage its demographic dividend simply do not exist in many parts of the developing world.

³⁴ See Fareed Zakaria, “Culture is Destiny: A Conversation with Lee Kuan Yew,” *Foreign Affairs* 73, no. 2 (March/April 1994).

Figure 4-6: GDP Per Capita (in 2005 PPP Dollars), as a Percent of Developed World Average, 1975-2005

	1975	1980	1985	1990	1995	2000	2005
Sub-Saharan Africa	11	9	7	6	5	5	5
Arab World	31	33	25	22	20	19	20
Non-Arab Muslim Asia	13	11	11	10	10	10	11
China & East Asia	4	4	6	7	10	12	15
India & South Asia	5	5	5	5	6	6	7
Latin America	35	35	30	26	26	25	25
Russian Sphere	51	47	46	41	23	22	29
Eastern Europe	50	48	45	38	32	34	39

Source: *World Development Indicators* (Washington, DC: The World Bank, 2007); and authors' calculations.

Transitions Too Fast or Too Far

While transitions that stall in their early stages perpetuate the familiar security risks associated with large youth bulges, transitions that progress too fast or too far can also become destabilizing. Rapid transitions, if they trigger rapid economic growth, may lift countries more quickly over the development hump and out of the worst danger zone for violence, instability, and war. But along the way, they actually increase the stresses of development and modernization. The faster the transition, the less time political systems, social institutions, and cultural attitudes have to adapt. Many social scientists and political historians believe that gradualism is more likely to result in peaceful development. Think of the history of Great Britain, where the industrial revolution unfolded over two centuries, versus Germany or Russia, whose compressed industrialization helped precipitate social revolution and world war.

Transitions that progress too fast or too far may also cause countries to grow old while they are still in the midst of development, undermining economic growth and threatening social and political stability. Ironically, East Asia, where the transition's impact has so far been most positive, now faces precisely this danger.

East Asia's dramatic fertility decline has set in motion an equally dramatic age wave. The UN defines an "aging society" as one in which the elderly make up at least 7 percent of the population and an "aged society" as one in which they make up at least 14 percent. East Asia passed the first threshold in 2001 and will pass the second in 2025, just 24 years later. It took France, the country that led the West's fertility decline, 115 years (starting in 1864) to complete that transition. It will take the United States (starting in 1942) 71 years. The only developed country to complete the transition as rapidly is Japan, which also required (starting in 1970) 24 years. The UN also defines a "super-aged society" as one in which the elderly make up at least 20 percent of the population. East Asia will reach that milestone by 2035, just 10 years further into the future. Incredibly, China will by then be as old as the United States—and South Korea and the other Tigers, whose elderly shares will be

shooting past 30 percent, will be competing with Japan, Italy, and Spain for the title of the oldest country on earth.

While France, the United States, and even Japan were all fully developed economies by the time they became aging societies, East Asia's age waves are arriving in societies which, despite their rapid economic growth, in many respects remain traditional. The fiscal pressures of aging may be less than in the developed world, since welfare states are still small. On the other hand, the social stresses are likely to be even greater. Even the more affluent Tigers have only just begun to fashion government and market substitutes for traditional family care networks. In China, three-quarters of the workforce has no pension coverage of any kind, public or private. The vast majority of the population still relies on the extended family for support in old age. Yet the family, which is shrinking in size and already under stress from modernization, may be overwhelmed by the burden of caring for the elderly. Elders in urban China today on average have three grown children to share the burden of their care; by 2025, they will have just 1.3.³⁵

The incredible speed of development in East Asia is already straining the economic and social fabric—and nowhere more so than in China. Vast armies of peasants are moving from traditional agricultural villages to bustling manufacturing hubs. Worker mobility and turnover is rising and the income gap between the rich and poor is widening. Social services are spotty and civic authority is strained. Such stresses, bearable in a youthful society in which incomes are rising rapidly, may become less tolerable in an aging society in which economic growth is slowing. Imagine a large share of today's midlife adults, tens of millions of whom have joined the ranks of China's low-wage floating population, maturing by the year 2020 or 2030 into tens of millions of indigent urban elders who lack pensions, lack access to health care, and lack adequate family support. Or imagine, in western rural regions, entire towns of demographically stranded elders.

Eastern Europe and the Russian sphere will also have to cope with the consequences of transitions gone too far. Both regions are already nearly as old as the developed world, and with fertility rates that have sunk to an average of 1.3, both face a future of dramatic population aging and population decline. Yet living standards remain well beneath the developed-world average—less than one-half in Eastern Europe and less than one-third in the Russian sphere. Over the past decade, economies in both regions have grown rapidly, and the countries of what used to be called the Second World are beginning to make up the ground they lost during their tumultuous transitions from planned to market economies. Rising old-age dependency burdens and contracting workforces threaten this progress. The outlook is especially unfavorable in Russia, where low birthrates are being compounded by deteriorating health and falling life expectancy.

The transition is thus giving rise to entirely new stresses in parts of the developing world where the demographic peace thesis suggests that population trends are benign. We don't yet know which way these stresses will push different countries, since history offers no examples of societies that are rapidly aging while

³⁵ Xiaochun Qiao, "From Decline of Fertility to Transition of Age Structure: Aging and Its Policy Implications in China," *Genus* 17, no. 1 (January-March 2001).

they are still in the midst of rapid development. On the one hand, the overlap increases the risk of chaotic collapse. On the other hand, it could push regimes in an even more authoritarian direction.

The New Demographic Competition

All of this will be occurring in an environment characterized by growing demographic competition. In transitioning societies, fertility often falls faster among some ethnic and religious groups than among others. The groups that are more slowly growing may feel that their traditional economic and political position is threatened, while those that are faster growing may feel emboldened to claim more power. Rapid development can heighten the tensions generated by differentials in ethnic and religious growth rates to the extent that some groups are more successful in the marketplace than others. So can rapid democratization, since greater numbers in democratic regimes translate directly into greater power at the ballot box. These dynamics are giving a powerful extra push to the realignment of political identities along ethno-religious lines that has come to characterize the post-Cold War world.

Demographic competition among ethnic and religious groups is already fueling conflict and provoking social and political backlash in many parts of the developing world. In Lebanon and Kosovo, the wide differentials in growth rates between declining Christian populations and demographically ascendant Muslim populations have helped to precipitate civil wars.³⁶ In Israel, the fear of being demographically overwhelmed by the faster-growing Palestinian population (Yasser Arafat once said that the Palestinian struggle with Israel will be won in the bedroom) has become a serious security concern—and according to Israeli Prime Minister Ehud Olmert it was a decisive factor in the decision to build the West Bank Barrier.³⁷ Meanwhile in Russia, where the ethnic Russian population is shrinking while Muslim minority populations continue to grow rapidly, differential growth rates are provoking contradictory reactions—fueling the rise of far-right Slavic nationalism on the one hand, while prompting some officials to call for a more pro-Muslim tilt to Russian foreign policy on the other.³⁸ In India, worries about higher Muslim fertility are similarly fanning the flames of Hindu nationalism.

In today's world of heightened ethnic and religious awareness and loyalties, the mere perception that one group may be gaining demographically at the expense of another can be enough to provoke conflict. Across the developing world, almost everywhere that large ethnic and religious divides exist within countries, ancient antagonists look anxiously to the latest demographic statistics for evidence of emerging population trends that may presage their political fortunes. Disputes over

³⁶ For a discussion of the Lebanese case, see Milica Bookman, *The Demographic Struggle for Power* (London: Frank Cass & Co. Ltd., 1997). For Kosovo, see Brian Nichiporuk, *The Security Dynamics of Demographic Factors* (Santa Monica, CA: RAND Corporation, 2000); and Monica Toft, "Differential Demographic Growth in Multinational States: Israel's Two-Front War," *Journal of International Affairs* 56, no. 1 (Fall 2002).

³⁷ Scott Wilson, "Olmert, Sworn In, Restates Goal; Evacuation of West Bank Settlements to Proceed, Israeli Premier Confirms," *The Washington Post*, May 5, 2006.

³⁸ Vladimir Dergachyov, interviewed by Darya Muravina, "'Islamic Threat' Is Not in Our Lexicon" (in Russian), *Stoletiye*, August 27, 2007.

national censuses have recently provoked clashes between Hindus and Muslims in India, Christians and Muslims in Nigeria, and Sunnis and Shias in Pakistan. In an effort to defuse tensions, the Nigerian government has abandoned collecting data on ethnic and religious affiliation. In Lebanon, where power-sharing between Christians and Muslims is formally tied to population numbers, the government has stopped taking censuses at all. In fact, there has been no census in Lebanon since 1932.

There is another kind of demographic competition that may have profound long-term implications for the security environment. Fertility rates not only vary between different ethnic and religious groups, but also within groups according to the intensity of religious convictions. In most countries, the demographic transition is led by the more secular members of society, while fertility rates decline more slowly among those who remain more religious. As we have seen, this is true in the United States, where the fertility rate in Red-Zone Utah is roughly 50 percent higher than in Blue-Zone Vermont. It is true in Israel, where the fertility rate of ultra-Orthodox Jews towers 3-to-1 over that of more secular Jews.³⁹ And it is true in many Muslim societies. According to a recent World Values Survey of Muslims in Algeria, Egypt, Jordan, Nigeria, Pakistan, Bangladesh, and Indonesia, those who strongly agree that the state should “implement Shari’a only” as the law of the land have larger families than those who strongly disagree. Among rural Muslims, the differential is nearly 1.5-to-1; among urban Muslims, it is even larger—nearly 2-to-1.⁴⁰ To the extent that fertility declines are concentrated among the more progressive and westernized elements in society, we may be exaggerating the extent to which the transition is pushing some countries toward modernity. In fact, as each successive birth cohort comes of age a larger share of youth will have been raised in more traditional and religious families. As Phillip Longman observes, “Those who reject modernity would seem to have an evolutionary advantage.”⁴¹

Meanwhile, in some rapidly transitioning societies in East and South Asia, falling fertility has also given rise to demographic competition at the family level—this time between baby boys and girls. In East Asia, families from time immemorial have exhibited a strong preference for sons, since in Confucian culture, among other duties, the son is responsible for caring for his parents in old age. Son preference is also deeply ingrained in some parts of India, where the high cost of dowries makes daughters less desirable. As parents decide to have fewer children—or in China, with its restrictive one-child policy, as they are required to have fewer children—they often wish to ensure that at least one child is a male. With inexpensive ultrasound technology widely available, sex-selective abortion has become commonplace. In a normal population, there are roughly 105 baby boys

³⁹ In 1995-96, the Israeli Ultra-Orthodox Jewish fertility rate was 7.6, compared with 2.3 for the rest of the Jewish population. See Philippe Fargues, “Protracted National Conflict and Fertility Change: Palestinian and Israelis in the Twentieth Century,” *Population and Development Review* 26, no. 3 (September 2000), 451.

⁴⁰ See Eric Kaufmann, “Religion and Politics: The Demographic Imperative” (paper presented at the Annual Meeting for the American Political Science Association, Chicago, August 30-September 2, 2007), 27.

⁴¹ Phillip Longman, “The Global Baby Bust,” *Foreign Affairs* 83, no. 3 (May/June 2004), 77.

born for every 100 girls. In India there are 110 boys born for every 100 girls and in China 117.⁴²

These exaggerated gender imbalances have ominous implications. Today's "missing girls," as they are called in China, will become tomorrow's missing brides. China is projected to have a surplus of some 30 million men of marriageable age by 2020, and the numbers in India are similar.⁴³ These unattached bachelors will constitute a kind of ersatz youth bulge whose members, given competition in the marriage market, are likely to belong disproportionately to society's least privileged classes. Large numbers of undomesticated males pose a challenge for any society, but in East and South Asia, with their near-universal expectation of marriage, the impact may be even more destabilizing. In *Bare Branches*, political scientist Valerie Hudson argues that the social and political volatility unleashed by so many unattached young men could lead to authoritarian government reactions—or even encourage governments to channel the energies of excess youth into military adventures.⁴⁴ While the impact of gender imbalances on foreign policy may be speculative, it is certain that they will add to social stress—and not just in the marriage market. In decades to come, today's deficit of baby girls will vastly exacerbate the burden of caring for growing elderly populations in societies that still rely heavily on the extended family to support the old. For even in Confucian cultures, it is of course the daughters-in-law, not the sons, who do the actual caring.

THE ASSUMPTIONS BEHIND THE PROJECTIONS

Projecting the developing world's future demographic course is difficult. We can be reasonably confident in making population projections for the developed world, because it has already completed the demographic transition and because fertility levels have been relatively stable in most countries for several decades. Much of the developing world, however, is still in the midst of the transition, and we cannot be certain how low fertility will ultimately fall in different countries and regions.

The UN medium variant, the most commonly cited global demographic projection, assumes that fertility everywhere in the developing world will eventually sink beneath replacement. Neither demographic theory nor the actual progress of the transition to date lends much support to this assumption. To be sure, fertility rates are now well beneath replacement in East Asia, Eastern Europe, and the Russian sphere—the regions of the developing world where the transition is most advanced. But these regions' unique cultures, greater economic development, and, in the case of China, draconian fertility policies, may make them poor models for projecting future fertility behavior in other parts of the developing world.

⁴² Isabelle Attané and Christophe Z. Guilmoto, "The Geography of Deteriorating Child Sex Ratio (sic) in China and India," in *Watering the Neighbor's Garden: The Growing Demographic Female Deficit in Asia*, eds. Isabelle Attané and Christophe Z. Guilmoto (Paris: Committee for International Cooperation in National Research in Demography, 2007), 109.

⁴³ Valerie M. Hudson and Andrea M. den Boer, *Bare Branches: The Security Implications of Asia's Surplus Male Population* (Cambridge, MA: The MIT Press, 2004), 183-184.

⁴⁴ Hudson and den Boer, *op. cit.*

Indeed, there is considerable reason to believe that fertility may fail to reach replacement in many countries. Although fertility in sub-Saharan Africa began to decline in the late 1970s, it has stalled at around 5.0 in many countries. In some populous Muslim countries, including Egypt and Bangladesh, fertility rates are decelerating around 3.0, and in much of Latin America, they appear to be plateauing between 2.0 and 2.5.

Some demographers are now reassessing fertility theories to account for these slowdowns. John Bongaarts, a leading demographer at the Population Council, suggests that fertility may decline in two phases, with the first driven largely by the diffusion of family planning programs and the second by human development, as measured by life expectancy, standard of living, and educational attainment, especially of women.⁴⁵ While the availability of safe and reliable contraception may help push fertility down from 6.0 to perhaps 4.0 or 3.0, reaching replacement requires a higher level of human development—which is much more difficult to attain. Sub-Saharan Africa’s fertility stall has indeed been accompanied by a stall in human development, and in a climate of widespread poverty, rising AIDS mortality, and chronic political instability, fertility is unlikely to resume its decline any time soon. Meanwhile, despite impressive progress in women’s educational attainment in many Arab countries, women are often denied access to the labor market, both because cultural norms favor hiring men and because male unemployment rates are high. Unless gender roles undergo a serious revision (and the economic outlook improves), fertility may remain stubbornly high in parts of the Arab world as well.

We should not underestimate the important role that cultural preferences could play in preventing countries from reaching replacement fertility. Some demographers believe that powerful cultural imperatives for large families are making it difficult for couples in many countries to adopt a two-child fertility ideal. In most sub-Saharan African countries, ideal fertility, like actual fertility, remains far above replacement.⁴⁶ In Egypt, by far the most populous Arab country, demographers have noted the failure of any segment of society to develop a “firm attachment” to a two-child fertility ideal—even the elites whom one would expect to lead the country to lower fertility.⁴⁷

Cultural preferences regarding contraceptive methods could also make the achievement of replacement fertility difficult in practice. In poor countries, sterilization is often the only affordable and reliable form of contraception. Yet in some cultures, notably Islam, there are proscriptions against permanent forms of

⁴⁵ See John Bongaarts, “Fertility Transition in the Developing World: Progress or Stagnation?” (paper presented at the Population Association of America Meeting, New York, March 28-31, 2007); John Bongaarts, “Completing the Fertility Transition in the Developing World: The Role of Educational Differences and Fertility Preferences,” *Population Studies* 57, no. 3 (November 2003); and John Bongaarts, “The End of the Fertility Transition in the Developing World,” Policy Research Division Working Papers no. 161 (New York: Population Council, 2002).

⁴⁶ Demographic and Health Surveys, Macro International Inc., <http://www.measuredhs.com/>.

⁴⁷ See Eltigani E. Eltigani, “Stalled Fertility Decline in Egypt, Why?” *Population and Environment* 25, no. 1 (September 2003); and John B. Casterline and Rania Roushdy, “Achieving Replacement-Level Fertility in Egypt: Challenges and Potential Opportunities,” *FRONTIERS* Final Report (Washington, DC: Population Council, 2006).

birth control. The cultural conditions may not exist for fertility to fall to replacement—much less below.

The projections that we use in this report assume that the transition will continue to progress in today's high-fertility countries, even those in which it has stalled. However, the assumed fertility declines are more gradual than in the UN medium variant and do not proceed as far. Specifically, for countries where fertility is currently above 2.35, we use the UN's so-called high variant projection, which assumes that fertility will gradually decline to the 2.35 level. This includes nearly all of sub-Saharan Africa and the Arab world, as well as most of non-Arab Muslim Asia, South Asia, and Latin America. Where fertility is already below 2.35, including all of East Asia, Eastern Europe, and the Russian sphere, we assume that the demographic transition is complete and instead use the UN's constant fertility projection, just as we do for the developed world. These assumptions are admittedly arbitrary. But they are no more arbitrary, and seem a good deal more plausible, than the medium variant assumption that fertility will eventually converge at 1.85 in all countries, from the United States and Yemen to India and Japan.

Appendix 1 includes a comparison of key demographic indicators under our projections and the medium variant. The differences, though not enormous, are nonetheless significant, especially for the Arab world, non-Arab Muslim Asia, South Asia, and Latin America, where youth bulges under the medium variant fall further in the near term (2005-2030) and elder shares rise further in the long term (2030-2050). The youth threat would be somewhat diminished if the future turns out to look more like the medium variant, but the threat of premature aging would loom larger. The direction of the trends, however, is the same. This is not surprising, since both projections assume that the transition will continue to progress and that fertility will fall to relatively low levels everywhere in the developing world. Our ultimate fertility assumption of 2.35 may be well above the medium variant's 1.85 assumption, but it is also far beneath current fertility rates in large swaths of the developing world. What if fertility fails to fall that far? To gauge the possible consequences, Appendix 1 also includes an alternative projection that shows what the demographic future of the developing world would look like if fertility behavior in all regions remains unchanged.

While assumptions about fertility dominate the long-term demographic outlook for the developing world, assumptions about longevity are also important. Average life expectancy in the developing world has risen dramatically over the postwar era, from 44 in the early 1950s to 66 today. In some countries in Eastern Europe, East Asia, Latin America, and the Arab world, it has reached the late 70s—in other words, developed-world levels. Wherever life expectancy has been rising steadily, which is to say most of the developing world, the UN assumes that improvements will continue in the future, though at a slower pace than in the past. Where life expectancy has stalled or fallen—the case in much of sub-Saharan Africa and the Russian sphere—it assumes that recent increases in mortality rates will be reversed and that life expectancy will once again begin to rise. This last assumption may be optimistic.

As for international migration, the UN assumes no major surprises. Most current large net emigration countries (such as India, the Philippines, and Mexico)

are expected to remain substantial sources of international migration, while the few large net immigration countries (such as Russia, Singapore, and the UAE) are expected to remain destinations. The overall level of net emigration from the developing to the developed world, however, is projected to fall by about one-third from its current historical high, with the largest drop in Latin America. Future migration flows, of course, could easily be larger or smaller. It is not certain that Latin America has passed the peak of the migration hump—and much of South Asia, the Arab world, and non-Arab Muslim Asia, not to mention sub-Saharan Africa, clearly hasn't. Immigration pressure is thus likely to remain high, and indeed may grow if development accelerates. On the other hand, it is possible that more restrictive immigration policies in the developed world could curtail global migration flows even more than the UN projects—or else redirect them from lower- to higher-wage economies within the developing world itself. These caveats notwithstanding, the projections offer a plausible baseline.

A TOUR OF THE DEVELOPING WORLD

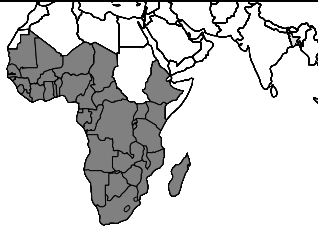
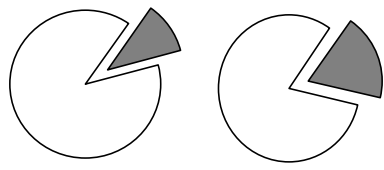
In the remainder of the chapter, we take the reader on a tour of the eight regions into which we have divided the developing world: sub-Saharan Africa, the Arab world, non-Arab-Muslim Asia, China and East Asia, India and South Asia, Latin America, Eastern Europe, and the Russian sphere. We briefly discuss the demographic outlook in each region and highlight salient trends that may affect future security risks.

Sub-Saharan Africa

Sub-Saharan Africa has the highest fertility rate, the lowest life expectancy, and the youngest and fastest growing population of any region in the world. Its youth bulge share—now 36 percent, more than double that of the developed world—will remain virtually unchanged over the next few decades. Its population, which has quadrupled since 1950, will nearly triple again by 2050. A half-century ago, the population of the developed world was three times that of sub-Saharan Africa. A half-century from now, the population of sub-Saharan Africa will be twice that of the developed world.

The region of course is not only the youngest in the world, but the poorest and the least developed. Real per capita income fell steadily in many countries between the mid-1970s and mid-1990s. And though economic growth has recently picked up in much of the region, per capita income in sub-Saharan Africa is still just 5 percent of the developed world average—less than half of what it was in 1965 as the colonial era drew to a close. With 43 percent of the population living on less than one dollar a day, the region has the highest poverty rates in the world.⁴⁸ It also has the lowest levels of “human development.” According to the United Nations Development Program, more than half of all sub-Saharan African countries have

⁴⁸ *World Development Indicators 2007* (Washington, DC: The World Bank, 2007) and authors' calculations.

Sub-Saharan Africa				
		2005	2030	2050
	Fertility Rate	5.6	4.1	3.0
	Life Expectancy	49.1	57.8	64.5
	Total Population (mil. & % change from 2005)	720	1,306 +81%	1,904 +164%
Percent of World Population				
	Working-Age Population (mil. & % change from 2005)	305	607 +99%	994 +226%
	Median Age	18.0	20.2	24.1
	Youth Bulge Share	36.2%	33.7%	28.2%
	Elderly Share	3.1%	3.6%	4.9%
	Total Dependency Ratio	136	115	91
	Youth Dep. Ratio	129	107	82
	Old-Age Dep. Ratio	7	8	9
		2005 = 11.1%		2050 = 18.8%

low human development, a composite indicator compiled from measures of life expectancy, literacy, and standard of living—and of the 22 countries in the world with low human development, all are in sub-Saharan Africa.⁴⁹

The region's long-term prospects for growth and stability are clouded by a health catastrophe of biblical proportions. AIDS, the modern day plague, will exact an enormous toll in sub-Saharan Africa, which is home to 68 percent of the world's total HIV-positive population.⁵⁰ The toll begins with the direct human and economic cost of premature mortality, which peaks in the mid-30s, just as adults are entering their potentially most productive years. But there is also the indirect and longer-term social cost, which may be even greater. By lowering life expectancy, AIDS reduces incentives to invest in human capital. It also threatens the welfare of the tens of millions of children it orphans, who are more likely to live in poverty and less likely to attend school. Already, one in ten children in sub-Saharan Africa has lost a parent to AIDS.⁵¹ Although HIV prevalence is stabilizing or even declining in some countries, this is not the case in the economic engine of the region—South Africa—which already has one of the highest adult prevalence rates in the world: 19 percent. Life expectancy in South Africa today is 53; without AIDS, it would be 66—13 years higher.⁵²

AIDS is merely the most spectacular among a host of daunting challenges facing the region. Many governments are weak, corrupt, and incapable of providing the most basic personal security and social services. Countries throughout the region are rent by tribal divisions—and indeed, tribal loyalties often run much deeper than loyalties to the state, which in most cases are not genuine nations but rather whims

⁴⁹ *Human Development Report 2007/2008* (New York: UNDP, 2007).

⁵⁰ *2007 AIDS Epidemic Update* (Geneva: UNAIDS, December 2007), 15.

⁵¹ *2006 Report on the Global AIDS Epidemic* (Geneva: UNAIDS, 2006), 92.

⁵² *World Population Prospects: The 2006 Revision* (New York: UN Population Division, 2007).

of colonial mapmakers. Although the region remains extremely poor, it is nonetheless urbanizing rapidly. Indeed, sub-Saharan Africa has the fastest growing urban population in the world, and also the largest share (over two-thirds) living in slums.⁵³ All of this helps to explain the region's bleak security outlook. According to the Center for International Development and Conflict Management, 18 of the 25 countries in the world that are most at risk of future instability are located in sub-Saharan Africa.⁵⁴

While there are of course islands of relative peace and prosperity in the region, few countries are entirely free from the risk of instability. South Africa and Nigeria, sub-Saharan Africa's two largest economies and regional hegemony, both confront serious threats. The first, as we have seen, is wracked by one of the world's worst AIDS epidemics, while the second faces a widening cleavage between its poor Muslim North and its more affluent Christian South—tensions that are now being exacerbated by a widening fertility differential between the two religious groups. Even “model democracies” in the region can veer suddenly toward state failure, as shown by the recent spasm of violence in Kenya between the market-dominant Kikuyu and the Luo and Kalenjin tribes following the disputed December 2007 election.

Although sub-Saharan Africa's demographic profile will continue to lean against stability for the next several decades, in the long run the outlook may improve. By the 2030s and 2040s, our projections show that life expectancy will be rising steadily, youth bulges declining, and dependency ratios falling. This demographic future, however, is not assured. The projections assume that both HIV infection rates and AIDS survival rates will improve over the next few decades. They also assume that fertility will fall, dropping to 4.1 by 2030, 3.0 by 2050, and eventually to 2.35 by 2070. Whether this will occur amid widespread poverty and chronic insecurity remains to be seen.

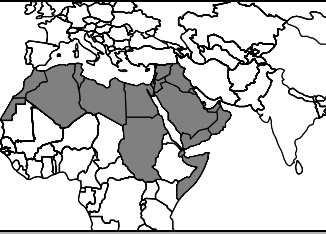
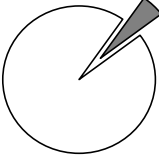
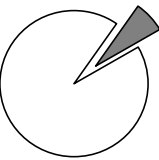
The Arab World

The countries of the Arab world are still very young and rapidly growing, with low median ages and large youth bulge shares. Unlike much of sub-Saharan Africa, however, most of the region is now progressing through the demographic transition. Fertility remains very high—between 4.0 and 6.5—in some of the poorest Arab countries, including the Palestinian Territories, Yemen, Somalia, and the Sudan, as well as in Iraq. However, it has dropped to between 3.0 and 4.0 in a number of the most regionally important countries, including Egypt, Syria, and Saudi Arabia. It has fallen even further, to between 2.0 and 3.0, in Algeria, Tunisia, Morocco, Libya, Lebanon, and the Gulf States. Meanwhile, region-wide life expectancy has risen steadily from 42 in 1950 to 67 today.

These trends will eventually transform most of the Arab countries into older societies. Between 2005 and 2050, the median age of the Arab world as a whole will rise from 22 to 31, while its youth bulge share will fall from 32 percent to 21 percent. By then, some of the region's lower-fertility countries will have median ages

⁵³ *State of the World Population 2007* (New York: UN Population Fund, 2007), 16.

⁵⁴ Hewitt, Wilkenfeld, and Gurr, *op. cit.*, 5.

Arab World				
		2005	2030	2050
	Fertility Rate	3.7	2.9	2.5
	Life Expectancy	66.9	73.6	76.9
	Total Population	324	526	693
	(mil. & % change from 2005)		+62%	+114%
Working-Age Population	162	284	384	
(mil. & % change from 2005)		+75%	+136%	
Percent of World Population				
				
2005 = 5.0%	2050 = 6.8%			
Median Age	22.1	26.8	30.7	
Youth Bulge Share	31.7%	25.5%	21.0%	
Elderly Share	4.0%	6.6%	10.6%	
Total Dependency Ratio	100	85	81	
Youth Dep. Ratio	92	73	62	
Old-Age Dep. Ratio	8	12	19	

in the upper 30s—and age structures that are not that much younger than the United States. In the long term, what Phillip Longman calls the “middle aging of the Middle East”⁵⁵ may help promote prosperity and stability in a region whose extreme youth has so far rendered both elusive. The journey there, however, promises to be a rocky one—and over the next few decades, demography will remain a highly destabilizing force.

Although population growth is slowing, the total population of the Arab world will still double by 2050. In some of the poorest and least stable countries, including the Palestinian Territories, Somalia, and Yemen, the population will triple. For a resource-poor desert country like Yemen that already faces acute water shortages (according to the World Bank, the water table in Yemen’s capital will be exhausted within two years)⁵⁶ this extra human burden may literally prove impossible to support. As for youth bulges, they will not decline appreciably in the region’s highest-fertility countries until the 2030s—and though they have now begun to fall in its faster-transitioning countries, youth populations, as we have seen, will once again surge in the 2020s. These echo booms in the more affluent and urbanized parts of the Arab world could prove as threatening to stability as lingering youth bulges in the poorer parts.

Unless much changes in the Arab world over the next decade, the echo booms of the 2020s are sure to worsen the already dim economic outlook for young adults. The alienation and radicalization of the rising generation in the Arab world today stems in part from the failure of most states, even the more affluent ones, to create dynamic modern economies. There are many reasons for the failure. Oil has

⁵⁵ Phillip Longman, “The Middle Aging of the Middle East,” *World Jewish Digest*, July 31, 2004.

⁵⁶ Cited in Robert F. Worth, “Yemen Strikes Difficult Truce with Terrorists,” *International Herald Tribune*, January 28, 2008.

allowed some countries in the region to acquire sudden wealth without the need to build an industrial base or foster the rise of an entrepreneurial middle class. To varying degrees in different countries, experts also fault poor governance, religious-based educational systems that fail to prepare students for economically productive jobs, and large public sectors that often offer the only middle-class employment opportunities.

The biggest victims of economic dysfunction are the young. Indeed, it seems there is hardly a place in the economy at all for much of today's Arab youth, who face some of the world's highest unemployment rates—roughly 20 percent region-wide for men aged 15 to 24 and 28 percent in Jordan, 31 percent in Tunisia, 39 percent in the Palestinian Territories, and 43 percent in Algeria.⁵⁷ In some countries, notably Egypt, unemployment rates rise along with educational attainment, and are highest of all for college graduates.⁵⁸ Since the age at which men marry is also rising in most countries, in part because of high unemployment, as many as two out of five young males are not married, not working, and not participating in the political system—a potent cocktail for civil unrest and radical political or religious conversion.

The appeal of radical Islam, of course, goes beyond economics or even politics. It is not just a means of protest against the discredited and oppressive status quo of secular Arab nationalism that has failed to create domestic prosperity. For many, it is also an antidote to the disorienting forces of modernization, and above all, the assault of Western values on traditional social and cultural norms. It is hard to see how emerging demographic trends will diminish this appeal. Indeed, they may intensify it among future youth cohorts, a rising share of whom will be the sons and daughters of fundamentalist parents.

In short, though demographics may ultimately push the Arab world in a hopeful direction, the security environment a decade or two from now could be as threatening as today's. Many young and poor countries will remain vulnerable to instability and state failure, while many rapidly transitioning ones will remain fertile terrain for international terrorism. All of this could reinforce the traditional autocratic bent of many governments—or perhaps spur the rise of neo-authoritarian regimes that are capitalist but not democratic, a model being pursued by the UAE and considered by Libya.

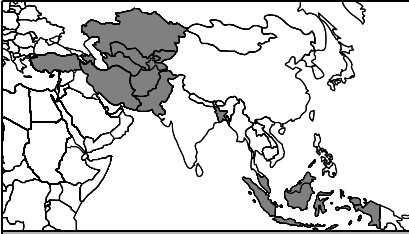
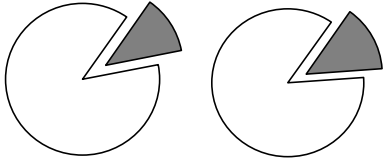
Non-Arab Muslim Asia

Although unified by Islam, non-Arab Muslim Asian countries are at different stages in the demographic transition and different stages of economic development. They also have very different orientations toward the West.

Turkey. Among all the countries in the region, Turkey's demographics may be the least threatening. With a median age of 27, it is one of the oldest Muslim countries.

⁵⁷ Ragui Assaad and Farzaneh Roudi-Fahimi, "Youth in the Middle East and North Africa: Demographic Opportunity or Challenge?" MENA Policy Brief (Washington, DC: Population Reference Bureau, April 2007), 3.

⁵⁸ Ragui Assaad, "Unemployment and Youth Insertion in the Labor Market in Egypt," ECES Working Paper no. 118 (Cairo: The Egyptian Center for Economic Studies, February 2007), 18.

Non-Arab Muslim Asia				
		2005	2030	2050
		Fertility Rate	3.0	2.7
	Life Expectancy	65.7	72.4	75.8
	Total Population	798	1,165	1,445
	(mil. & % change from 2005)		+46%	+81%
	Working-Age Population	418	654	806
	(mil. & % change from 2005)		+56%	+93%
	Median Age	23.6	29.5	32.7
	Youth Bulge Share	30.4%	23.0%	19.7%
	Elderly Share	4.6%	7.8%	12.1%
	Total Dependency Ratio	91	78	79
	Youth Dep. Ratio	82	64	58
	Old-Age Dep. Ratio	9	14	22
Percent of World Population				
				
	2005 = 12.2%	2050 = 14.3%		

Its fertility rate is close to replacement, its youth bulge share is falling rapidly, and because its transition has been gradual, it will not have to cope with a large echo boom. The separatist movement among its Kurdish minority aside, Turkey is also a reasonably cohesive society with a growing industrial economy, a functioning democracy, and a large middle class. Until recently, the long-term geopolitical orientation of Turkey seemed clear: tied to and allied with the West. But the rise to power of the Justice and Development Party, with its Islamic roots, has reopened old questions about Turkey's identity. Turkey's modern secular state, after all, was originally imposed on an overwhelmingly Muslim population by an autocratic regime—and though Turkey has now been a secular state for 85 years, it was home to the Caliphate for 500 years before that. Will Turkey maintain its militant secularism? Will it forge a moderate Islamic democracy? Or will it take some different and more radical course? It is not yet clear which way things will tilt. But if Turkey's bid to join the EU fails, it could push the country in an unpredictable direction—if not toward Islamism then at least away from the West.

The Central Asian Republics. The transition is well underway in most of the Central Asian Republics. Fertility is now at or beneath replacement in Kazakhstan and Azerbaijan, and has fallen beneath 3.0 everywhere except impoverished Tajikistan. As in Turkey, youth bulges are now rapidly receding—but unlike Turkey, most of the Central Asian Republics will face large echo booms in the 2020s. Central Asia has long been a battlefield for larger powers, from the Mongols and Persians to the Russians and British. After a long period of Soviet rule, these newly independent states once again find themselves the object of geopolitical competition. They possess huge natural gas and oil reserves, are sandwiched geographically between Russia, Iran, and China, and are being courted by the United States, which maintains a major military base in Kyrgyzstan that is critical to the Afghan campaign. As yet,

the long-term geopolitical tilt of the Central Asian Republics is unclear. In some ways they are growing further apart from Russia, as ethnic Russians continue to emigrate and the republics reassert their indigenous identities (ending Russian instruction in schools, for instance). Yet at the same time, political and economic ties to Russia remain strong. All of the Central Asian Republics are members of the Commonwealth of Independent States, or CIS (though Turkmenistan has downgraded its status), Russia still dominates the region's natural gas and oil industry, and several countries (notably Azerbaijan and Uzbekistan) send large numbers of migrants to Russia. Adding to the uncertainty are questions about the future of the region's (often dynastic) authoritarian regimes, as well as a growing threat of Islamic extremism in Uzbekistan and Tajikistan, which border Afghanistan. The region is thus likely to remain in flux—which is what makes its looming echo booms worrisome.

Iran. Although Iran's demographic transition began very late, it has progressed at a stunning pace. Since 1980, fertility has fallen by more than two-thirds, from 6.5 to 2.1—faster than almost any nation in history. While this means that Iran's youth bulge share will plunge, it also ensures that its echo boom will be huge. In fact, the swing in youth bulge population growth rates—from negative 3.6 percent per year in the 2010s to plus 2.7 percent per year in the 2020s—will be the largest of any country in either the Arab world or non-Arab Muslim Asia. How the echo boom will affect Iran is uncertain. It might intensify growing youth resentment over high unemployment, government-enforced moral codes, and political exclusion and direct it against the state—which is to say the Islamic theocracy erected by their parents (or grandparents). On the other hand, it could add new momentum to Iran's apparent ambition to become a dominant regional power. Most of the states in the Middle East are artificial creations of colonialism, but not Iran, with its long history of Persian political and cultural identity. Iran is solidly middle income—with a higher per capita GDP than Turkey—technologically advanced, and except for minorities in peripheral regions, ethnically and religiously cohesive. It also increasingly sees itself as the champion of Shia communities throughout the Middle East and Central Asia. Whatever happens, with its likely acquisition of nuclear capability, Iran will be important.

Afghanistan, Pakistan, and Bangladesh. These three countries have and will continue to have the youngest and fastest growing populations in the region. Afghanistan and Bangladesh are also the two poorest countries, and even Pakistan's per capita income is less than one-third of Turkey's and barely one-fifth of Iran's. In Afghanistan, which has a median age of 16 and a fertility rate of 7.5, demographics will be leaning against peace and prosperity for a long time to come. Pakistan and Bangladesh, with fertility rates of 4.0 and 3.2, are further through the transition. But both still have large youth bulges that will decline only slowly—and Pakistan, like Iran, will face a large echo boom in the 2020s. Pakistan is of course a key link in the U.S. global war on terror. Yet in a recent cover story, *The Economist*, with some justification, calls Pakistan “the world's most dangerous place.”⁵⁹ Very young and rapidly growing, with deep ethnic and religious divisions, a haven to the Taliban in

⁵⁹ “The World's Most Dangerous Place,” *The Economist*, January 3, 2008.

its tribal territories, and armed with nuclear weapons, it will remain a major security concern for the foreseeable future. Although Bangladesh doesn't have Pakistan's ethnic divisions, it is extremely poor, overpopulated, and apparently facing an emerging Islamist threat.

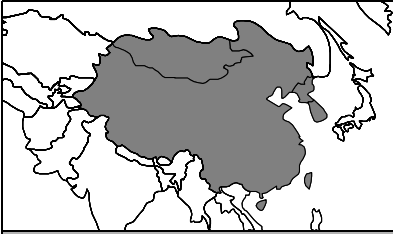
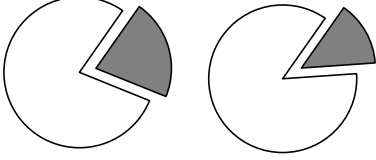
Indonesia and Malaysia. The transition is progressing steadily in the two Southeast Asian Muslim countries, and in Indonesia fertility is approaching replacement. Malaysia, sometimes called the "Islamic Tiger," is one of the Muslim world's great economic success stories, but its cohesion is also threatened by the deep rift between its market-dominant Chinese minority and its politically dominant Malay majority. At first glance, Indonesia, a nation comprising 17,508 islands with 300 distinct native ethnicities speaking 742 languages and dialects, would seem to face insuperable obstacles to long-term stability. And indeed, Indonesia in recent years has had to grapple with armed separatist movements, violent clashes between ethnic and religious minorities, and Islamic terrorism. Yet at the same time, it also has a strong indigenous tradition of moderate Islam—what its mainstream Islamic party calls "soft Islam."⁶⁰ Like Malaysia, it has borrowed much economically from the East Asian model, and though it has a long and sometimes brutal autocratic history, it is transitioning toward democracy. While the long-term futures of Malaysia and Indonesia remain in doubt, they could, along with Turkey, become beacons of success for the rest of the Muslim world.

China and East Asia

The demographic transition has proceeded with breathtaking speed in East Asia. Until the late 1960s, East Asia's fertility rate weighed in at roughly 6.0, about the developing-world average at the time. But by the early 1990s, just 25 years later, it had already dropped beneath the 2.1 replacement rate. Fertility in East Asia now averages just 1.7, and in the Tigers it has sunk far lower—to 1.4 in Singapore, 1.2 in South Korea, and just 0.9 in Hong Kong. Median ages have already risen to the low-30s in China and to the mid- to upper-30s in the Tigers. Meanwhile, the youth bulges that helped fuel social and political upheaval in China during the late 1960s and early 1970s and South Korea and Taiwan during the early 1980s have faded. A new demographic threat, however, looms just over the horizon. As we have seen, the entire region (except for North Korea and Mongolia) will soon be aging rapidly.

East Asia's demographic tipping point is fast approaching. For the past three decades, its unusually favorable demographics, with low dependency ratios and large shares of the population in the working years, have helped to boost economic growth. But beginning around 2015, the demographics will be thrown into reverse. Old-age dependency ratios will surge, tripling over today's level by the mid-2030s in China and quadrupling in some of the Tigers. At the same time, working-age populations in all the major economies of the region, including China, will peak and begin to decline. In China, the absolute magnitude of the coming age wave is staggering. By 2050, there will be 334 million elderly in China, 103 million of them aged eighty or older.

⁶⁰ "Where 'Soft Islam' is on the March," *The Economist*, January 10, 2008.

China & East Asia				
		2005	2030	2050
	Fertility Rate	1.7	1.7	1.7
	Life Expectancy	72.2	76.7	79.4
	Total Population	1,399	1,517	1,421
	(mil. & % change from 2005)		+8%	+2%
	Working-Age Population	866	936	799
	(mil. & % change from 2005)		+8%	-8%
	Median Age	32.6	42.2	47.4
	Youth Bulge Share	21.0%	13.7%	11.4%
	Elderly Share	7.7%	16.8%	25.2%
Percent of World Population				
				
2005 = 21.5%		2050 = 14.0%		
Total Dependency Ratio	61	62	78	
Youth Dep. Ratio	49	35	33	
Old-Age Dep. Ratio	13	27	45	

The age wave is overtaking China at an awkward moment in its development—just as it is poised to become a middle-income country and assume a greater role in world affairs. The rapid pace of China's economic development, and the sweeping social changes that accompany it, have sometimes been likened to a speeding bicycle that has to keep going just to keep from falling over. China's aging increases this pressure. On the one hand, it makes rapid growth even more essential, since workers will have to transfer a growing share of their wages to nonworking elders, either through families or public budgets. On the other, it makes rapid growth more difficult to achieve. As China ages, the social stresses of breakneck development, from widening income gaps to weakening families, are likely to intensify. Meanwhile, the speeding bicycle faces another bump in the form of China's yawning gender imbalance and the ersatz youth bulge it is creating.

China has been "peacefully rising" while its demographics have leaned with economic growth. But by the 2020s, demographic trends may be weakening the two principle pillars of the current regime's political legitimacy—rapidly rising living standards and social stability. It is hard to gauge how great the risk of social and political crisis is, but the Chinese government, with its new mantra of "balanced development" and its increasing alarm about the dangers of the rural-urban income gap, the shredded social safety net, and environmental degradation, appears to be taking it seriously. Throughout China's long history, periods of strong central authority and empire-building have alternated with periods of social and political chaos—or what the Chinese call *luan*. Could the overlap of rapid aging and rapid development usher in the next turn of the cycle? And will the threat push China in an even more authoritarian direction? While the answer is not yet clear, it will be by the 2020s.

Aging may not pose as great a danger for the Tigers, which are far more affluent and developed than China. But they too are becoming increasingly alarmed about

the economic and social impact. After decades of discouraging births, South Korea and Singapore have reversed course and are now actively encouraging them with pronatal tax breaks, baby bonuses, and, in the case of Singapore, even a government-sponsored dating service. Ethnically homogeneous South Korea is also cracking open the door to immigration, out of not just economic but social necessity. In rural Korea, four out of ten men's marriages are now to foreign brides, mostly from Southeast Asia.⁶¹ Much more, however, will have to change if the Tigers are to remain engines of global growth. The challenge may be greatest for South Korea, whose GDP exceeds that of the other three Tigers combined. It has an authoritarian workplace culture and a traditional family structure that make it difficult for women to balance jobs and families; low and mandatory retirement ages in the formal sector that lock older workers out of productive employment; and an inadequate and immature public pension system that still leaves families bearing the brunt of the burden of supporting the old. The required adjustments will be enormous—and the age wave is fast approaching.

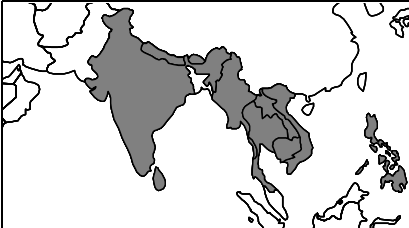
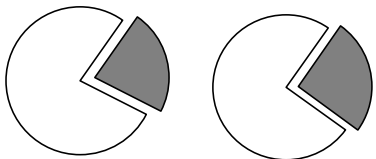
North Korea stands apart demographically, as in so many other ways. Its fertility rate is surprisingly low—just 1.9—and its youth bulge share is only marginally higher than South Korea's. Yet because its fertility rate fell more gradually and has not dropped as far, and because life expectancy is lower, it does not face a large age wave. If North Korea were another country, one might consider its demographics benign. But North Korea poses a significant demographic threat—namely, the possibility of its sudden collapse. South Korea understandably hopes for a gradual and staged process of political rapprochement and economic integration with the North, since immediate reunification would cause an enormous living-standard shock. Per capita income in the South is more than ten times that in the North, far larger than the gap separating West and East Germany on the eve of their reunification.

Although the rise of East Asia, and particularly China, is producing enormous benefits for the global economy, it is also raising troubling questions for the United States about the future shape of the world order. The countries of East Asia are modernizing while retaining their own distinct cultural traditions, and indeed sometimes attribute much of their economic success to their adherence to “Asian values” and rejection of “Western individualism.” All of the Tigers had authoritarian regimes during their period of most rapid development, which helped them not just boost growth but manage the stresses of modernization. Over the past decade or so, South Korea and Taiwan have evolved into stable liberal democracies. China, however, has not, which could make its economic success as potentially threatening as its failure.

India and South Asia

The transition in India and South Asia, though well underway, has not progressed as fast or as far as in East Asia. Although fertility still remains high in some countries, it has fallen substantially in most, including India, where it is now dropping beneath

⁶¹ Anna Fifield, “South Korean Farmers Look Further Afield for Brides,” *Financial Times*, November 28, 2006.

India & South Asia				
		2005	2030	2050
	Fertility Rate	3.0	2.5	2.3
	Life Expectancy	64.0	72.0	76.1
	Total Population	1,492	2,115	2,548
	(mil. & % change from 2005)		42%	71%
	Working-Age Population	783	1,196	1,454
	(mil. & % change from 2005)		+53%	+86%
	Median Age	24.1	29.8	33.9
	Youth Bulge Share	28.6%	22.8%	18.5%
	Elderly Share	5.0%	8.5%	12.6%
Percent of World Population				
				
2005 = 22.9%	2050 = 25.2%			
Total Dependency Ratio	91	77	75	
Youth Dep. Ratio	81	62	53	
Old-Age Dep. Ratio	10	15	22	

3.0. In Myanmar, Sri Lanka, and Vietnam, it hovers around replacement, and in Thailand, the region's lowest-fertility country, it has fallen to 1.8. While youth bulge shares are still much higher than in East Asia, they are now falling in all of the region's major economies. The echo booms of the 2020s, moreover, will be much smaller than in the Arab world or non-Arab Muslim Asia. Age waves, meanwhile, will arrive much later than in East Asia and will be much smaller. Only Thailand and Sri Lanka are projected to have an elderly share that approaches China's projected share, and then not until the 2030s and 2040s. In short, the region is moving toward age structures that are neither extremely young nor extremely old—and this may confer some significant advantages.

India's size alone makes it of obvious geopolitical importance. Although its economy is now just 46 percent as large as China's, its population is 86 percent as large. By 2020, India is due to overtake China as the world's most populous country, a position China has held for most of human history. By 2030, India's working-age population will also overtake China's, and by 2050 it will be 50 percent larger.

China of course has leapt ahead of India in economic development and enjoys a large productivity advantage that India may find impossible to close. Indeed, India labors under a number of handicaps. Although it has a well-educated and English-speaking middle class and competitive high-tech and services outsourcing sectors, the vast majority of its enormous rural population (which comprises 71 percent of the total population) are poorly prepared to participate in the growth sectors of its economy. The public education system for the masses is widely acknowledged to be dismal—and 39 percent of the population is illiterate, compared with just 9 percent in China.⁶² To be sure, as China's industry begins to move up the global value-added scale, it too is confronting an emerging gap between the skills of its workforce and

⁶² UNDP, *op. cit.*, 238-239.

the demands of the new jobs its economy is creating. But the skills mismatch is an even more acute problem for India, whose “leapfrog” development has largely bypassed basic manufacturing altogether. India’s failed education system is part of a broader deficiency—the state’s incapacity to provide basic public goods and infrastructure. And where the state is not needed, it often gets in the way by over-regulating the labor market or heaping excess regulation on business.

India must overcome other obstacles as well. There are the huge inequalities in its caste system, which stubbornly persist despite government affirmative action. There are the simmering tensions between its Hindu majority and Muslim minority. And there is of course the dangerous standoff with Pakistan, which continues to threaten the long-term stability of the subcontinent. In addition to these longstanding problems, there is also an emerging new challenge—namely, a large gender imbalance that could create additional social stresses in the years ahead.

Yet the Indian tortoise also enjoys some advantages over the Chinese hare. China’s demographic dividend is all but behind it, while India still has many years of falling dependency ratios ahead. And India faces a gentle and delayed age wave, while China faces an onrushing tsunami. The elderly share of India’s population will rise gradually from 5 percent today to 8 percent by 2030 and 12 percent by 2050, close to what it is in the United States today. Meanwhile, China’s will leap from 8 percent to 25 percent. And when China’s working-age population begins contracting after 2015, India’s will be expanding at a steady pace. Beyond the basic population trends, India’s more gradual transition also means that the stresses of development may be more bearable. At the same time, its deeply embedded democratic tradition, while at times responsible for deadlocked policy reform, helps guarantee a measure of long-term political stability.

A rising India is likely to have long-term strategic interests in common with the United States. They not only share a liberal democratic tradition, but also have common interests in waging the war on terror and in balancing a rising China. Indeed, the perception of common interests may help to explain why India, which historically has had an ambivalent relationship with the United States, is now one of the most solidly pro-American countries in the world and, unlike most other countries, is growing more pro-American.⁶³

The other countries of South Asia encompass a wide range of demographic, economic, and political circumstances. Some (such as Cambodia, Laos, Nepal, and the Philippines) are only midway through the transition, while others (such as Myanmar, Sri Lanka, Thailand, and Vietnam) are close to completing it. Some are rapidly developing, while others are still poor and traditional. Some are moving toward democracy, however haltingly, while others, such as Myanmar and Vietnam, appear to be embracing the China model. Many, from Myanmar and Thailand to the Philippines and Sri Lanka, are battling longstanding insurgencies and separatist movements among ethnic and religious minorities—though only in Sri Lanka does the conflict threaten to overwhelm the state. Yet despite all this diversity, most of these countries have one thing in common. Except for the more U.S.-aligned

⁶³ “India: Pro-America, Pro-Bush,” Pew Global Attitudes Project, Pew Research Center, February 28, 2006, <http://pewglobal.org/>.

Philippines, they ultimately gravitate in the orbits of their vastly larger and more powerful neighbors, India and China. They are thus likely to remain the focus of geopolitical competition in the future.

Latin America


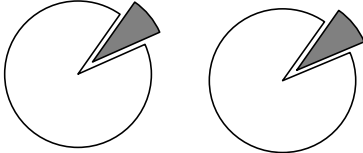
The transition is also well underway in Latin America. On average, fertility in the region has fallen from 6.0 to 2.5 since the early 1960s—much further than in the Arab world and significantly further than in non-Arab Muslim Asia and South Asia. This regional average, however, conceals considerable differences at the country level. Fertility began to fall much earlier in ethnically and culturally European Argentina and Uruguay than in the rest of the region, and is now near replacement. Fertility has also fallen to roughly replacement in Brazil, Chile, and Costa Rica—and in Cuba, it has been well beneath replacement since the 1980s. Meanwhile, in some poorer countries with large indigenous populations (Belize, Bolivia, French Guyana, Honduras, and Paraguay) fertility is still above 3.0, and in a few (Guatemala and Haiti) it is above 4.0. The rest of the region, including populous Mexico, Columbia, Peru, and Venezuela, lies somewhere in between.

In the near term, large and growing youth populations will remain a potentially destabilizing force in Latin America. Youth bulge shares are still very high in many of the region's poorest and least stable countries—over 30 percent in Guatemala, Honduras, Nicaragua, Haiti, Bolivia, and Paraguay. And though they are now declining rapidly elsewhere in the region, several countries, including Peru and Venezuela, among the region's least stable democracies, will face large echo booms in the 2020s.

In the longer term, most countries in the region, even the poorest, will begin to feel the pressures of population aging. Overall, the elderly share of the population in Latin America is projected to rise from 6 percent in 2005 to 11 percent by 2030 and to 16 percent by 2050, well above the averages for the Arab world, non-Arab Muslim Asia, or South Asia. In some countries, including Chile and Uruguay, the elderly share will be passing 20 percent by 2050—and in Cuba, it will be passing 30 percent. Even Mexico, which Americans still associate with extreme youth, will have an elderly share of 18 percent by mid-century, not much lower than the 20 percent projected for the United States. Most of Latin America's age waves, to be sure, are both much smaller and further over the horizon than East Asia's. But they will pose a significant challenge for a region in which the social safety net in most countries is inadequate, pension coverage is spotty, and living standards are barely rising from one generation to the next.

If much of Latin America risks growing old before it grows rich, it is not because populations in the region are aging so rapidly, but because economies are growing so slowly. As we have seen, far from closing the income gap with the developed world, most Latin American countries have been falling farther behind over the past few decades. In fact, there are only two countries in the entire region that have gained on the developed world since 1975: Belize and Chile.

There are many reasons for Latin America's poor economic performance. There is its long history of overregulation, macroeconomic mismanagement, punitive taxation, and widespread government corruption. In a recent World

Latin America		2005	2030	2050
	Fertility Rate	2.5	2.4	2.3
	Life Expectancy	72.0	77.1	79.6
	Total Population (mil. & % change from 2005)	558	758 +36%	893 +60%
	Working-Age Population (mil. & % change from 2005)	303	423 +39%	485 +60%
Percent of World Population				
	Median Age	26.0	32.0	35.1
	Youth Bulge Share	26.6%	20.7%	18.2%
	Elderly Share	6.3%	11.2%	16.0%
	Total Dependency Ratio	84	79	84
	Youth Dep. Ratio	72	59	55
	Old-Age Dep. Ratio	12	20	29
	2005 = 8.6%			2050 = 8.8%

Economic Forum report on global competitiveness, only one Latin American country ranked in the top 50 worldwide—Chile in 26th place.⁶⁴ There are its two-tiered labor markets, with privileged and over-protected formal sectors and large low-wage informal sectors. And there are the deep-seated social and economic inequalities, which often fall along ethnic lines between European-origin and indigenous or mixed-race populations. Latin America, which has always had the world's highest Gini coefficients, constitutes a well known exception to the Kuznets Inverted-U-Curve hypothesis.

Many countries in the region, from Argentina to Mexico, have made considerable progress over the past decade and a half in reforming their economies. Living standards, which fell almost everywhere during the “lost decade” of the 1980s, are beginning to rise again. Economic reform has been accompanied by political reform. In 1975, only 15 percent of the region's population lived in countries that Freedom House characterized as fully “free”; today, 74 percent do.⁶⁵ Yet despite the progress, the foundations of long-term economic prosperity and political stability in much of Latin America are still shaky—and are likely to remain so as long as inequality remains so pervasive and growth so disappointing.

The United States has of course intervened in Latin America to protect its interests many times in history—and developments in the region, from the rise of a hostile and neo-authoritarian Venezuela to the disposition of post-Castro Cuba, obviously enter U.S. security calculations. Yet as Michael Reid argues in *The Forgotten Continent*, apart from episodic political and military interventions, Latin America has

⁶⁴ *The Global Competitiveness Report 2007-2008* (Geneva: World Economic Forum, 2007), 10.

⁶⁵ *Freedom in the World* (Washington, DC: Freedom House, various years), <http://www.freedomhouse.org/>.

always remained largely peripheral to U.S. foreign policy.⁶⁶ This may change in the future as the Hispanic-origin share of the U.S. population grows. Given the future demographic profile of the United States, the public may come to pay closer attention to problems in the region, especially in Mexico and Central America, and be more apt to demand that the United States play a larger and longer-term role in fostering its development and stability. Historical antagonisms will take time to fade, but with more uniting us than dividing us, it may be possible to build a strategic North-South alliance.

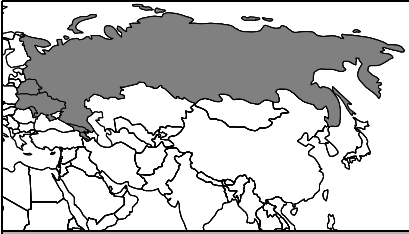
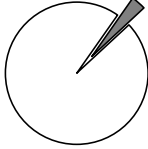
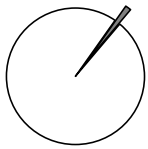
The Russian Sphere

In most of the developing world, fertility didn't fall until the late 1960s or early 1970s. In the Russian sphere—that is, Russia and the Christian CIS countries of Russia's "near abroad"—the transition began much earlier. Fertility in most of the region started to fall early in the twentieth century, and in Russia and the Ukraine it had already reached replacement by the 1960s. After plateauing in the 1970s and 1980s, fertility then plunged far beneath replacement in the 1990s, where it remains today. Georgia, Moldova, and Armenia, with rates in the 1.4 to 1.5 range, pass for fecund countries in this region. In Russia, the Ukraine, and Belarus, which together account for over nine-tenths of the region's population, fertility hovers between 1.2 and 1.3. Like East Asia, the Russian sphere thus faces a future of rapid population aging and decline.

In some respects, the demographic outlook for the Russian sphere is much more daunting than the outlook for East Asia—or indeed, any region in the world outside sub-Saharan Africa. Conventional demographic wisdom assumes that declining fertility goes hand in hand with declining mortality as the transition progresses. Belarus, the Ukraine, and especially Russia, with its risky lifestyles, prodigious rates of per capita alcohol consumption, and crumbling health-care system, are defying that wisdom. Even as fertility has collapsed in Russia, mortality rates have soared. Life expectancy for Russian men has now fallen well beneath what it was for their grandfathers in the 1950s. Men in Russia today can expect to live to age 58.5, 20 years less than Japanese men, 16 years less than American men—and 3 years less than Bangladeshi men. Yet even with a survival schedule typical of a low-income country, Russia is set to ride a developed-world age wave. Its elderly share is already 14 percent and will nearly double to 26 percent by mid-century. Today Russia's median age is 37, marginally younger than the developed world, but by 2050 it will be marginally older at 49.

The Russian economy may be riding high on a whirlwind of profits from its bountiful natural resources. But Russia is still much less affluent than the developed world—it has just one-third of the per capita income—and its long-term economic potential is being steadily weakened. Deteriorating health and falling life expectancy slowly erode a nation's human capital, thereby undercutting the foundations of stability—economic growth, social and familial cohesion, and government strength. The economic impact is clear enough. Lower life expectancy lowers savings rates

⁶⁶ Michael Reid, *The Forgotten Continent: The Battle for Latin America's Soul* (New Haven, CT: Yale University Press, 2007).

The Russian Sphere				
		2005	2030	2050
	Fertility Rate	1.3	1.3	1.3
	Life Expectancy	65.9	70.6	74.0
	Total Population	212	176	142
	(mil. & % change from 2005)		-17%	-33%
	Working-Age Population	132	110	82
	(mil. & % change from 2005)		-17%	-38%
	Median Age	37.5	44.8	49.9
	Youth Bulge Share	19.8%	12.8%	9.9%
	Elderly Share	14.3%	19.8%	26.9%
Percent of World Population				
				
2005 = 3.3%	2050 = 1.4%			
Total Dependency Ratio	61	60	72	
Youth Dep. Ratio	38	28	26	
Old-Age Dep. Ratio	23	32	46	

and discourages investment in education; unhealthy workers are less productive and foreign companies are reluctant to invest in regions with a high mortality burden. As Nicholas Eberstadt observes, “in the modern era, the wealth of nations is represented, increasingly, in human rather than natural resources,” and thus the positive relationship between life expectancy and per capita output is extremely robust.⁶⁷ In one analysis, an additional year in life expectancy corresponds to a 4 percent increase in steady-state GDP per capita.⁶⁸

The combination of extreme sub-replacement fertility and low and falling life expectancy is a recipe for depopulation. Russia’s total population of 144 million is already decreasing by roughly 700,000 per year. By 2030, it will fall to 121 million and by 2050 to 99 million, about one-quarter of what the U.S. population will then be. This would constitute a spectacular decline in Russia’s world population ranking, from 4th place in 1950 to 20th place in 2050. In percentage terms, the population decline projected for Russia—31 percent between 2005 and 2050—far exceeds that of any other major power. China, though its working-age population will decline significantly, will see its total population decline by just 2 percent between 2005 and 2050. These projections, moreover, are actually quite optimistic, since they assume a steady improvement in Russian mortality rates. In fact, there is no sign of an impending mortality recovery in Russia, which means that the actual level of depopulation could be much greater. If mortality rates remain unchanged, we project that Russia’s population would fall to 88 million by 2050. Allowing for Russia’s worsening AIDS epidemic, projections by demographer Murray Feshbach

⁶⁷ Nicholas Eberstadt, “Russia’s Demographic Straightjacket,” *SAIS Review* 24, no. 2 (Summer/Fall 2004), 20.

⁶⁸ David E. Bloom, David Canning, and Jaypee Sevilla, “The Effect of Health on Economic Growth: A Production Function Approach,” *World Development* 32, no. 1 (January 2004), 10.

indicate that its population could be as low as 77 million by 2050—barely half of today’s size.⁶⁹

As Russia contracts demographically, it will also become less ethnically Russian. Low birthrates are mostly an affliction of the Orthodox Slav population. Russia’s large Muslim minority has higher fertility rates and lower mortality rates, which, combined with immigration from the Central Asian Republics, means that it will grow steadily as a share of the total population. How much will depend crucially on the future rate of Muslim immigration. Assuming that the spike of the past few years subsides, we project that the share would rise from 14 percent in 2005 to 19 percent in 2030 and 23 percent in 2050.⁷⁰ Some projections are much higher, and at least one expert predicts that Russia will be majority-Muslim by mid-century.⁷¹ Meanwhile, the demographic vacuum that is forming in the Russian Far East as ethnic Russians migrate back toward the country’s heartland is attracting a growing number of Chinese migrants across a border that is becoming increasingly permeable. Russia, of course, has always been home to a large number of ethnic minorities, and unlike Western Europe, most of its Muslim population is indigenous. In a demographically expanding Russia this diversity did not threaten national cohesion. In a demographically contracting Russia, however, it is provoking a backlash among ethnic Russians and further fanning the flames of nationalist reaction.

There are few places in the world today so in the grips of nationalist revanchism as Russia. And there are few peoples with so little regard for democracy. In a 2007 Pew Survey of 47 countries, Russia scored at or near rock bottom in support for core democratic values like freedom of religion, freedom of speech, and honest multi-party elections. Twice as many Russians (63 percent versus 27 percent) say that a “strong leader” is more important for solving the country’s problems than a democratic government.⁷² When a national or ethnic group feels imperiled, it may reach for illiberal solutions—and when its geopolitical ambitions are threatened, it may act unpredictably.

Russia’s demographic future certainly does not square well with its geopolitical ambitions, and its leaders are well aware of this problem. The government is responding by offering financial inducements for ethnic Russians living abroad to repatriate. It is also introducing new, and sometimes creative, pronatal incentives. Ulyanovsk, a region on the Volga east of Moscow, has for the past three years declared September 12 a “Day of Conception” and given couples time off from work to procreate. Women who give birth to “a patriot” nine months later on June 12, Russia’s national holiday, receive cash and prizes.⁷³ The problem is that most ethnic Russians living abroad who wish to return already have. As for the pronatal

⁶⁹ “Scholar Predicts Serious Population Decline in Russia,” Woodrow Wilson International Center for Scholars, January 29, 2004, <http://www.wilsoncenter.org/>.

⁷⁰ See Appendix 1 for projection assumptions.

⁷¹ Michael Mainville, “Muslim Birthrate Worries Russia; Majority Seen by Midcentury,” *The Washington Times*, November 21, 2006.

⁷² “World Publics Welcome Global Trade: But Not Immigration,” Pew Global Attitudes Project, Pew Research Center, October 4, 2007, 65, <http://pewglobal.org/>.

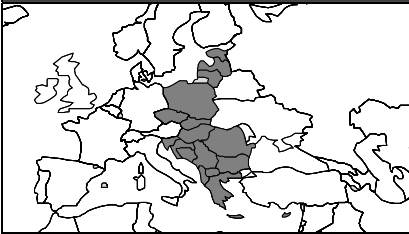
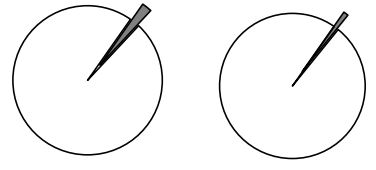
⁷³ Liza Kuznetsova, “Russian Governor Sponsors Conception Day,” Associated Press, August 14, 2007.

incentives, even if they are successful they will take a long time to work. Negative demographic momentum has already set in in Russia, and it will take decades to alter its demographic trajectory. In the meanwhile, the forces of demography threaten to become more destabilizing with each passing year.

Eastern Europe

As in the Russian sphere, fertility in Eastern Europe began to fall much earlier than in the rest of the developing world—and as in the Russian sphere, it has plunged far beneath replacement. Fertility in most countries in the region now ranges between 1.2 and 1.4. The exceptions are all in the Balkans: Orthodox Serbia, Macedonia, and Montenegro, where fertility ranges between 1.5 and 1.8, and Muslim Albania, the only country in the region (with a rate of 2.3) that is still above replacement. The population of Eastern Europe, like the Russian sphere's, is thus due to age and contract dramatically in decades to come. By 2030, the elderly share in almost every country in the region will exceed 20 percent, and by 2050 it will be approaching 30 percent in many countries and 35 percent in some, including Bulgaria, the Czech Republic, Greece, and Slovenia. Meanwhile, populations will enter a steep decline. While Western Europe will lose 18 percent of its working-age-population and 4 percent of its total population by 2050, Eastern Europe will lose 32 percent and 22 percent, respectively. Indeed, it will be the fastest-depopulating region in the world other than the Russian sphere.

As the countries of Eastern Europe confront their age waves, most enjoy a significant economic advantage over the countries of the Russian sphere—namely, membership in the EU and the integration of labor and capital markets that comes along with it. Yet they are less prepared to face the stresses of population aging and decline than the countries of Western Europe. To begin with, most of the countries of Eastern Europe are still far from fully developed. Although incomes in most of

Eastern Europe					
		2005	2030	2050	
	Fertility Rate	1.3	1.3	1.3	
	Life Expectancy	73.9	78.1	80.7	
	Total Population	138	127	108	
	(mil. & % change from 2005)		-8%	-22%	
	Working-Age Population	86	77	59	
	(mil. & % change from 2005)		-10%	-32%	
	Percent of World Population				
		Median Age	37.5	46.4	52.2
		Youth Bulge Share	17.7%	11.7%	9.4%
Elderly Share	14.5%	21.9%	31.0%		
Total Dependency Ratio	61	65	85		
Youth Dep. Ratio	38	29	27		
Old-Age Dep. Ratio	23	36	57		

the region have grown rapidly over the past decade, living standards still lag those in Western Europe by a wide margin. Overall, per capita income is just 45 percent of the Western European average. In much of the Balkans, including Albania, Bulgaria, Romania, and Serbia, it is just one-fifth to one-third of Western Europe's. Yet most countries are saddled with large welfare states inherited as a legacy of Communism. Total tax burdens in the region's major economies are nearly as high as in Western Europe. Meanwhile, labor-force participation rates and retirement ages are low, even by EU standards. A few countries, most notably Poland and Hungary, are now transitioning to fully funded public pension systems that will help control old-age benefit costs. But others may face future public old-age dependency burdens of French, German, or even Italian proportions.

Eastern Europe is not only poorer than Western Europe, but its states are newer, their authority and even their boundaries are less well established, and, less than 20 years after the Iron Curtain came down, market and democratic institutions are still developing. The Balkans in particular are riven by bitter ethnic and religious divisions between and within states. Continued differentials in growth rates between Catholic (fastest declining), Orthodox (more slowly declining), and Muslim (still growing) populations threaten to exacerbate these tensions. Meanwhile, depopulation could progressively undermine stability throughout the region—by eroding economic and tax bases, shuttering schools and businesses, and hollowing out communities. In many countries, from Poland to Romania, the impact of low birthrates is being amplified by an exodus of young workers to the more affluent economies of Western Europe. As depopulation sets in, the demographic vacuum it creates may draw in migrants from still poorer countries to the East and the South in a kind of “fluid replacement” that further exacerbates ethnic and religious tensions in one of history's great tinderboxes.

Throughout history, the countries of Eastern Europe have found themselves pushed and pulled by much larger powers to the West and East. This will be as true in the twenty-first century as it was in the eighteenth, nineteenth, or twentieth. On the one side, there will be an affluent but weakening Western Europe. On the other side, there will be an increasingly unstable but assertive Russia. The countries of “New Europe” are uncertain whether they can count on “Old Europe” to protect them, and they are not powerful enough to protect themselves. The largest economy in the region, Poland, is just one-fifth the size of Germany. This helps to explain why many countries in the region have aligned their foreign policies with the United States, even as they integrate economically into the EU. The direction in which demographic trends are pushing the dominant European powers may reinforce this pro-American tilt in the future.

A RISKIER WORLD

Rather than a broad and straight highway to the end of history, the demographic transition thus turns out to be a winding road with many dead ends, unexpected turns, and steep hills to climb. As we have seen, stalled transitions threaten to leave some of the world's poorest countries prey to instability and prone to state failure.

Meanwhile, transitions that have proceeded too fast and too far could undermine growth and stability and provoke unpredictable responses in some of the developing world's largest and most successful economies. In most countries, rapid development is triggering economic, social, and cultural stress that is likely to grow more, not less, intense as the transition progresses. All of this will be occurring in an environment characterized by increasing demographic competition between (and even within) ethnic and religious groups.

Of course, some countries will successfully navigate the perils of the transition and emerge affluent, technologically advanced, civically cohesive, and politically stable societies. Yet even here, there is a danger. We cannot take for granted that success will push all countries toward democracy and peaceful integration into the world community. The transition may also propel the rise of new peer competitors that do not share our vision, values, and global agenda.

Contrary to what is often assumed, a rapidly transitioning developing world is likely to be a riskier world. While demographic science cannot foretell exactly where and when crisis will erupt, it does suggest that the risks to security in much of the developing world will become most acute in the 2020s, just as the developed world will itself be experiencing its moment of greatest demographic stress.

Chapter Five

A DEMOGRAPHIC MAP OF OUR GEOPOLITICAL FUTURE

In the final chapter, we lay out the major conclusions of the report. These findings are organized into two groups: first, important conclusions about the overall demographic transformation in both the developed and developing worlds; and second, critical geopolitical implications for U.S. and developed-world security strategy. During the course of the report, we have frequently stressed the importance of relative demographic weight in influencing geopolitical stature. Here we also introduce GDP projections through the year 2050 that allow us to assess trends in the relative economic weight of the different regions and countries of the world. The assumptions and methodology of our GDP projection model are described in Appendix 1.

We close the report by laying out a framework for action. We outline possible policy responses in four broad areas: (1) policies designed to slow demographic aging itself, including pronatalism and stepped-up (or better managed) immigration; (2) policies designed to help the economy function better in the face of demographic aging, including initiatives that would lower old-age transfer burdens, raise national savings, and make labor markets more flexible; (3) policies that help adapt diplomacy and strategic alliances to the new geopolitical threats and opportunities arising from global demographic change; and (4) policies that help adapt defense posture and military strategy to the new realities.

MAJOR FINDINGS: THE DEMOGRAPHIC TRANSFORMATION

- *The world is entering a demographic transformation of historic and unprecedented dimensions.*

The transformation, which is often called “global aging,” is not a transitory wave like the baby *boom* many affluent countries experienced in the 1950s or the baby *bust* they experienced in the 1930s. It is, instead, a fundamental shift with no parallel in the history of humanity. “When this revolution has run its course,” observe aging experts Alan Pifer and Lydia Bronte, “the impacts will have been at least as powerful as those of any of the great economic and social movements of the past.”¹

¹ Alan Pifer and Lydia Bronte, “Introduction: Squaring the Pyramid,” in *Our Aging Society Paradox and Promise*, eds. Alan Pifer and Lydia Bronte (New York, W.W. Norton, 1986), 1.

Consider median age. Until the beginning of the twentieth century, a national median age higher than 30 was practically unheard of. As recently as 1950, no nation in the world had a median age higher than 36. Today, eight of the sixteen nations of Western Europe have a median age of 40 or higher. By 2050, six will have a median age of 50 or higher. So will 17 of the 24 nations in Eastern Europe and the Russian sphere, as will Japan and the East Asian Tigers. (See Figure 5-1.) Or consider population growth. Throughout all of history until now, populations have behaved in one of two ways. They have grown steadily, or they have declined fitfully due to disease, starvation, or violence. In the coming decades we will see something entirely new: large, low-birthrate populations that steadily contract. There are already 18 countries in the world with contracting populations. By 2050, there will be 44, the vast majority in Western and Eastern Europe, the Russian sphere, and East Asia. (See Figure 5-2.) As historian Niall Ferguson has written, we are about to witness “the greatest sustained reduction in European population since the Black Death of the fourteenth century.”²

- *The coming transformation is both certain and lasting; there is almost no chance that it will not happen—or that it will be reversed in our lifetime.*

The public is sometimes skeptical of long-term expert forecasts (about resource depletion climate change, for example) based on complex methodologies and difficult assumptions. Here, however, there is no reason for skepticism. Demographic aging is about as close as social science ever gets to a certain forecast. Every demographer agrees that it is happening, and that absent a global catastrophe—a colliding comet or a deadly super virus—it will continue to gather momentum.

The reason is simple: Anyone over the age of 43 in the year 2050 has already been born and can therefore be counted. And although the number of younger people cannot be projected as precisely, few demographers believe that low fertility rates in the developed world will reverse anytime soon. Some suggest that societies with very low fertility may enter a social and cultural “low fertility trap” that prevents fertility from rising again. Even if that does not happen and even if fertility rates do experience a strong and lasting rebound, the declining share of young (childbearing age) adults in the population will delay any positive impact on overall population. As we have seen, demographers call this demographic momentum. Population growth takes a long time to slow down. Once stopped, it takes a long time to speed up again.

- *The transformation will affect different groups of countries at different times. The regions of the world will become more unlike before they become more alike.*

As the term global aging correctly implies, nearly every country in the world is projected to experience some shift toward slower population growth and a higher median age. This does not mean, however, that the world is demographically converging. Most of today’s youngest countries (such as those in sub-Saharan

² Niall Ferguson, “Eurabia?” *New York Times Magazine*, April 4, 2004.

Figure 5-1: Countries Whose Median Age is Projected to be 50 or Over in 2050*

Taiwan	56.3	Hong Kong, SAR	54.0	Armenia	52.3
Japan	56.2	Ukraine	54.0	Croatia	52.1
Bulgaria	55.9	Romania	53.9	Cuba	52.0
South Korea	55.5	Slovakia	53.9	Germany	51.8
Slovenia	55.3	Latvia	53.8	Belarus	51.7
Czech Republic	55.0	Italy	53.5	Hungary	51.2
Poland	54.4	Greece	53.3	Portugal	51.1
Singapore	54.3	Lithuania	52.8	Austria	50.9
Spain	54.2	Bosnia & Herzegovina	52.7	Georgia	50.2

*Excludes countries whose population is less than 1 million.

Source: *World Population Prospects* (UN, 2007); and Population Projections for Taiwan Area 2006-2051, Council for Economic Planning and Development, Taiwan, <http://www.cepd.gov.tw/encontent/>.

Figure 5-2: Countries Projected to Have Declining Populations, by Period of the Decline's Onset*

Already Declining:		Decline Beginning: 2009-2029		Decline Beginning: 2030-2050	
Hungary	(1981)	Italy	(2010)	Azerbaijan	(2030)
Bulgaria	(1986)	Slovakia	(2011)	Denmark	(2031)
Estonia	(1990)	Bosnia & Herzegovina	(2011)	Belgium	(2031)
Georgia	(1990)	Greece	(2014)	Thailand	(2033)
Latvia	(1990)	Serbia	(2014)	North Korea	(2035)
Armenia	(1991)	Portugal	(2016)	Singapore	(2035)
Romania	(1991)	Cuba	(2018)	Netherlands	(2037)
Lithuania	(1992)	Macedonia	(2018)	Switzerland	(2040)
Ukraine	(1992)	Spain	(2019)	United Kingdom	(2044)
Moldova	(1993)	Taiwan	(2019)	Hong Kong, SAR	(2044)
Belarus	(1994)	South Korea	(2020)	Puerto Rico	(2044)
Russian Federation	(1994)	Austria	(2024)	Kazakhstan	(2045)
Czech Republic	(1995)	Finland	(2027)		
Poland	(1997)	China	(2029)		
Germany	(2006)				
Japan	(2008)				
Croatia	(2008)				
Slovenia	(2008)				

*Excludes countries whose population is less than 1 million.

Source: See Figure 5-1.

Africa) are projected to experience the least aging. Most of today's oldest countries (Japan and those in Western and Eastern Europe) are projected to experience the most aging. As a result, the world will experience an increasing divergence or "spread" of demographic outcomes over the foreseeable future.

During the 1960s, for example, 99 percent of the world's population lived in nations that were growing at a rate of between +0.5 percent and +3.5 percent annually. By the 2030s, that 99 percent range will widen to between -0.9 percent and +3.5 percent annually. By then, most nations will be growing more slowly, and indeed many will be shrinking—but some will still be growing at a blistering pace of 3-plus percent per year. In both Western Europe and the Arab world, the median age will rise between now and 2050. But the median age in Western Europe will rise slightly faster, causing the gap between median ages to widen. Here again, the trend is toward increasing demographic diversity.

- *In the countries of the developed world, the transformation will have sweeping strategic, economic, social, and political consequences.*

Size of the Population and Economy. Most obviously, the growth rates of the service-age population, the working-age population, and (therefore) of the GDP in the typical developed country will all fall far beneath their historical trend and also beneath growth rates in most of the rest of the world. In many developed countries, workforces will actually shrink from one decade to the next—and GDPs may stagnate.

Structure and Productivity of the Economy. In slowing and aging economies, the sectoral shift toward services will accelerate, employees will become less adaptable and mobile, innovation and entrepreneurship will decline, rates of investment and savings will fall, public-sector deficits will rise, current-account balances will turn negative, and arguments over immigration (both pro and con) will intensify.

Social Mood. Psychologically, an older society will be more conservative in outlook and possibly more risk-averse in electoral and leadership behavior. Shrinking nuclear families could produce youth who are more achievement-oriented yet also less sociable; shrinking extended families could pose a challenge to communities. Ongoing immigration and higher-than-average minority fertility may trigger inter-ethnic friction and diaspora politics in many countries. Senior control over taxes and benefits will become increasingly controversial, perhaps pitting more secular native-born elders against more religious young families (both native and ethnic minority).

- *In the countries of the developing world, the transformation will have a more varied spectrum of consequences, depending on the region and demographic trajectory.*

At the opportunity end, some developing countries will learn to translate the "demographic dividend" of their declining fertility rate into human and capital development, efficient and open markets, rising incomes and living standards, and stable democratic institutions. Some will follow the meteoric success path of a South

Korea or Taiwan, others the slower-but-still-steady success path of an India or Malaysia.

A larger share of the developing world, unfortunately, stands nearer to the challenge end. There are the countries (most notably, in sub-Saharan Africa) least touched by global aging, whose large youth bulges, high poverty, weak governments, and chronic civil unrest offer the least prospect of success. There are the countries (in the Arab world and much of South Asia) where population growth is declining and substantial economic growth is more likely—but where terrorism and dangerously destructive revolutions and wars are also more likely. And then there are the countries whose demographic transformation will be so extreme (Russia) or is arriving so rapidly (China) that population change itself could become a critical social and political issue. Russia, Ukraine, and the other Christian CIS countries, afflicted both by very low fertility and declining life expectancy, are projected to lose an astonishing one-third of their population by 2050. China, having suddenly adopted a “one-child policy” in the 1970s, will face a developed country’s level of elder dependency with only a developing country’s income.

MAJOR FINDINGS: THE GEOPOLITICAL IMPLICATIONS

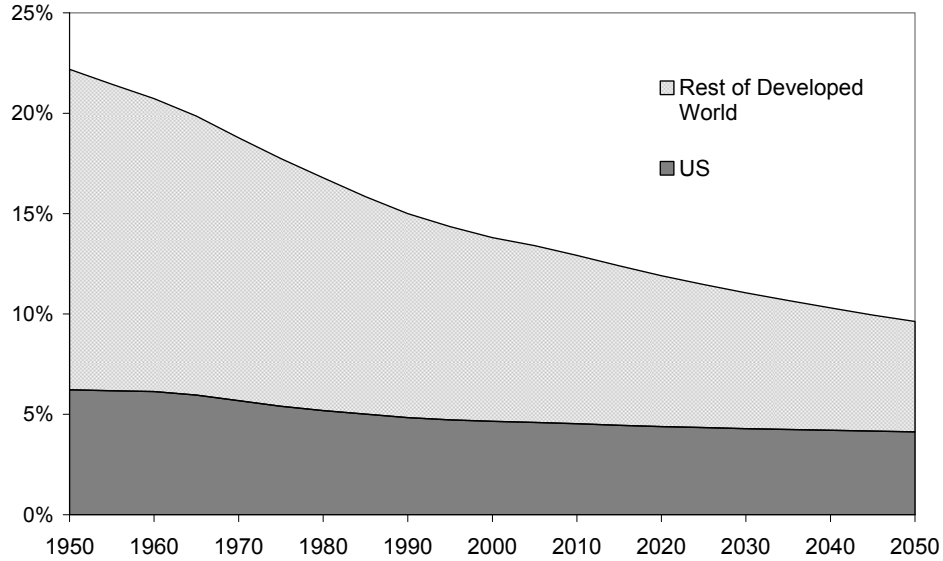
- *The population and GDP of the developed world will steadily shrink as a share of the world’s total. In tandem, the global influence of the developed world will likely decline.*

During the era of the Industrial Revolution and Western imperial expansion, the population of today’s developed nations (mainly Western Europe, Britain, its former colonies, and Japan) grew faster than the rest of the world’s population. From about 17 percent in 1820, their share of the world’s population grew steadily and peaked at about 25 percent in 1930.³ Since then, their share has declined. By 2005, it stood at just 13 percent, and it is projected to decline still further to below 10 percent by 2050. (See Figure 5-3.) As a share of the world economy, the collective GDP of the developed countries will similarly shrink, from 54 percent in 2005 (in purchasing power parity dollars) to just under 50 percent by 2015 and to 31 percent by 2050. Driving this decline will be not just the slower growth of the developed world, but the surging expansion of such large, newly market-oriented economies as China, India, and Brazil. (See Figure 5-4.)

Implications: In the years to come, developed-world security alliances will need to fortify their global position by bringing powerful new members into their ranks as equal partners. They will also have to watch out for powerful new competitors, acting singly or in concert, who may want to challenge the existing global order. By 2050, the very term “developed nations” is likely to encompass several gigantic new economies. Today’s long-term security planners need to prepare accordingly.

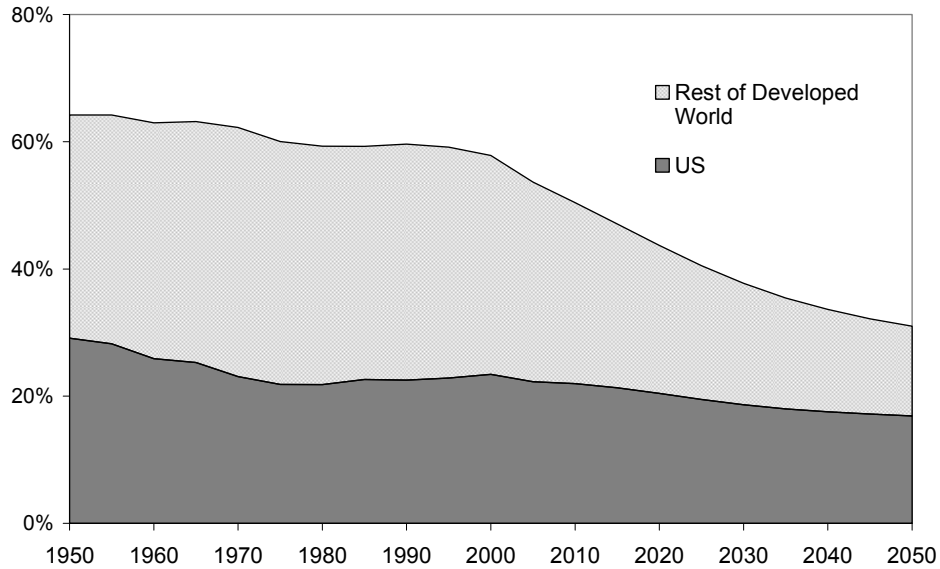
³ Angus Maddison, *World Population, GDP and Per Capita GDP, 1-2003 AD*, August 2007, <http://www.ggdc.net/maddison/>.

Figure 5-3: Developed World Population, as a Share of World Total, 1950-2050



Source: *World Population Prospects* (UN, 2007).

Figure 5-4: Developed World GDP (in 2005 PPP Dollars), as a Share of World Total, 1950-2050



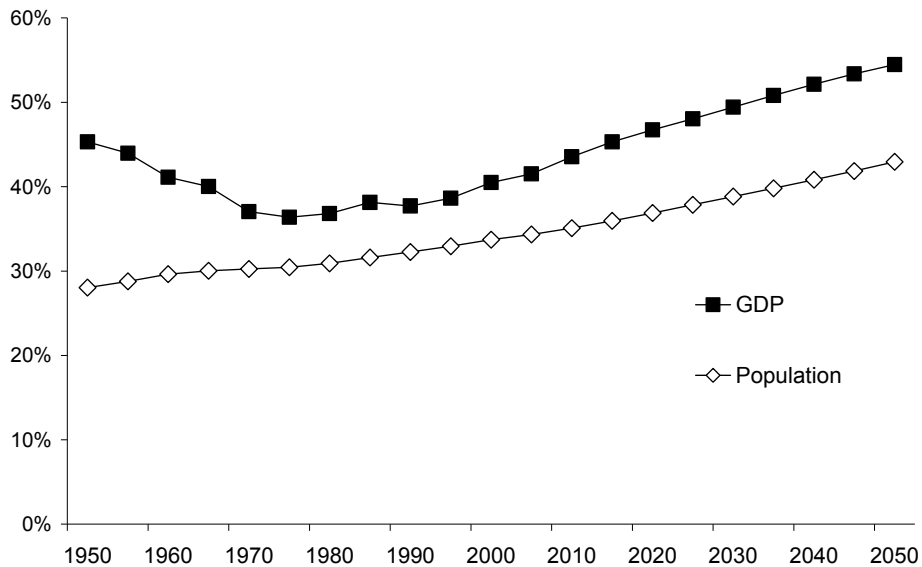
Source: Authors' calculations. See "Global GDP Projection Model" in Appendix 1.

- *The population and GDP of the United States will steadily expand as a share of the developed world's total. In tandem, the influence of the United States in the developed world will likely rise.*

Over the last two centuries, the U.S. share of the developed world's population has risen almost continuously, from a mere 6 percent in 1820 to 34 percent today. With its higher rates of fertility and immigration, the U.S. share will continue to grow in the future—to 43 percent by 2050. (See Figure 5-5.) By then, 58 percent of the developed world's population will live in English-speaking countries, up from 42 percent in 1950. The U.S. economic position will improve even more dramatically. As recently as the early 1980s, the GDPs of Western Europe and the United States (again, in purchasing power parity dollars) were about the same, each at 37 percent of total developed-world GDP. By 2050, the U.S. share will rise to 54 percent and the Western European share will shrink to 23 percent. The Japanese share will meanwhile decline from 14 percent to 8 percent. By the mid-twenty-first century, the dominant strength of the U.S. economy in the developed world will have only one historical parallel: the immediate aftermath of World War II, exactly 100 years earlier, at the birth of the “Pax Americana.”

Implications: Many of today's multilateral theorists look forward to a global order in which the U.S. influence diminishes. In fact, any reasonable demographic projection points to a growing U.S. dominance among the developed nations that preside over this global order. As Ben Wattenberg puts it, “The New Demography

Figure 5-5: U.S. Population and GDP (in 2005 PPP Dollars), as a Share of Developed World Total, 1950-2050



Source: Authors' calculations. See "Global GDP Projection Model" in Appendix 1.

Figure 5-6: 12 Largest Countries Ranked by Population*

Ranking	1950	2005	2050
1	China	China	India
2	India	India	China
3	US	US	US
4	Russian Federation	Indonesia	Indonesia
5	Japan	Brazil	Pakistan
6	Indonesia	Pakistan	Nigeria
7	Germany	Bangladesh	Bangladesh
8	Brazil	Russian Federation	Brazil
9	UK	Nigeria	Ethiopia
10	Italy	Japan	Dem. Rep. Congo
11	Bangladesh	Mexico	Philippines
12	France	Viet Nam	Mexico
		(14) Germany	(18) Japan
		(20) France	(26) Germany
		(21) UK	(27) France
		(23) Italy	(32) UK
			(39) Italy

*Developed countries are in boldface; future rankings for developed countries projected to fall beneath 12th place are indicated in the parentheses.

Source: *World Population Prospects* (UN, 2007).

may well intensify the cry that America is ‘going it alone’—not because we want to, but rather because we have to.”⁴ The United States is the only developed nation whose population ranking among all nations—third—will remain unchanged from 1950 to 2050. Every other developed nation will drop off the radar screen. (See Figure 5-6.) The United States is also the only developed economy whose aggregate economic size will nearly keep pace with that of the entire world’s economy.

- *Most nations in sub-Saharan Africa and some nations in the Arab world and non-Arab Muslim Asia will possess large ongoing youth bulges that could render many of them chronically unstable until at least the 2030s.*

As we have seen, political demographers generally define a “youth bulge” as the ratio of youth aged 15 to 24 to all adults aged 15 and over. As the youth bulge rises, so does the likelihood of civil unrest, revolution, and war; and when the youth bulge exceeds 35 percent, the likelihood grows explosive. In today’s sub-Saharan Africa, burdened by the world’s highest fertility rates and ravaged by AIDS (which decimates the ranks of older adults), the *average* youth bulge is 36 percent. Several Muslim-majority nations (both Arab and non-Arab) have youth bulges of similar size. These include Iraq, Syria, the Palestinian Territories, Somalia, Sudan, Yemen,

⁴ Ben J. Wattenberg, *Fewer: How the New Demography of Population Will Shape Our Future* (Chicago: Ivan R. Dee, 2004), 7.

and Afghanistan. In recent years, most of these African and Asian nations have amply demonstrated the correlation between extreme youth and violence. If the correlation endures, chronic unrest could persist in most of these countries through the 2030s—or even longer if fertility rates do not fall as quickly as projected.

Implications: While all of these countries will likely remain “trouble spots” for decades to come, most of the trouble will not have geopolitical repercussions—except when it involves terrorism or interferes with the flow of important natural resources. Upon occasion, developed countries will intervene either for humanitarian purposes (stopping genocide, alleviating natural disasters), or to prevent violence from spreading across national borders. Even modest development assistance, especially in public health, may help some of these nations break the cycle of high fertility and high poverty.

- *Many nations in North Africa, the Middle East, South and East Asia, and the former Soviet bloc—including China, Russia, Iran, and Pakistan—are now experiencing a rapid or extreme demographic transition that could push them toward civil collapse, or (in reaction) toward “neo-authoritarianism.”*

Some of these nations have buoyantly growing economies, others not. Some have a recent history of political upheaval, others not. Yet all are fast-modernizing—and all are encountering mounting social stress from some combination of globalization, urbanization, rising inequality, family breakdown, environmental damage, ethnic conflict, and religious radicalism. China faces the extra challenge of handling a vast tide of elder dependents come the 2020s when it will just be becoming a middle-income country. Russia needs to cope with a rate of population decline that literally has no historical precedent in the absence of pandemic. Any of these countries could, at some point, suffer upheaval and collapse—with grim regional (and perhaps even global) repercussions. In response to the threat of disorder, many will be tempted to opt for neo-authoritarian regimes (following the current lead of China or Russia).

Implications: While these fast-transitioning countries may experience less chronic violence than the large youth-bulge countries, the crises they do experience will tend to be more serious. Their economies are more productive, their governments are better financed, their militaries are better armed, and their rival factions better organized. Several have nuclear weapons. Many stand on the knife-edge between civil chaos and one-party autocracy. In their economic and demographic development, most have entered the phase of maximum danger and must therefore be watched closely.

- *Ethnic and religious conflict will continue to be a growing security challenge both in the developing and developed world.*

Over the last 20 years, ethnic conflict in the developing countries has been on the rise—due to the reemergence of ethnic loyalties suppressed during the Cold War and to the rise of electoral democracies that enable ethnic groups to vie against each

other at the ballot box. Globalization may also inflame ethnic resentment by enriching some groups at the expense of others. In many developed countries, ethnic tensions are being inflamed by the rapid growth in immigrant minorities as a share of the population. All of these trends can be expected to continue in the decades to come. Intensifying religious conflict can be inferred from the following fact: Fully two-thirds of the world's population growth between now and 2050 is projected to occur in exactly those regions—sub-Saharan Africa, the Arab world, non-Arab Muslim Asia, and India and South Asia—where religious conflict (between and among Muslims, Christians, Jews, and Hindus) is already a serious problem. And within those regions, the disproportionate fertility of devout families will ensure that younger generations will be, if anything, more committed to their faiths.

Implications: In a rapidly modernizing world, the appeal of ethnic and religious loyalty will remain powerful. The developed world needs to demonstrate that it respects this loyalty while at the same time defending pluralism and taking a hard line against aggressors who harness zealotry for destructive ends. It will help greatly if the developed countries are able to demonstrate, within their own borders, that the assimilation of ethnic and religious minorities really does work. Given its track record of relative success, the United States will need to take the lead in this effort.

- *Throughout the world, the 2020s will likely emerge as a decade of maximum geopolitical danger.*

In the developed world, the 2020s is the decade in which demographic aging hits the fastest. Workforces will practically stop growing almost everywhere—and begin to shrink rapidly in much of Western Europe and Japan—with unpredictable economic consequences. The number of elderly per 100 workers will surge from 34 to 42, with especially large jumps in countries (like the United States) that had large postwar baby booms. Some governments may experience a fiscal crisis. Meanwhile, in the developing world, new demographic stresses will appear. Many Muslim-majority countries (both Arab and non-Arab) along with some Latin American countries will experience a temporary resurgence in the number of young people in the 2020s. This youth echo-boom (a 30 percent jump in the number of 15 to 24 year-olds in Iran) may rock regimes. The countries of the Russian sphere and Eastern Europe will enter their decade of fastest workforce decline, even as China, by 2025, finally surpasses the United States in total GDP (in purchasing power parity dollars). Yet China will face its own aging challenge by the 2020s, when its last large generation, born in the 1960s, begins to retire.

Implications: Security planners must keep in mind that demographic change is nonlinear. The 2020s promise to be a decade in which breaking population trends come to play an important role in world affairs. According to “power transition” theories of global conflict, China's expected displacement of the United States as the world's largest economy during the 2020s could be particularly significant. By 2025, China's economy will also be four times larger than Japan's and three times larger than India's. At the same time, however, China will be grappling with a sudden rise in its aging burden and a sudden decline in its workforce. The net outcome is uncertain.

- *The aging developed countries will face chronic shortages in young-adult manpower—posing challenges both for their economies and their security forces.*

As the developed world ages, domestic youth shortages will create powerful economic incentives to encourage immigration and trade and to create new types of global “offshore” service businesses. Political opposition from older electorates is certain. With the number of service-age youth flat or declining in most countries (especially in the rural subcultures that have traditionally supplied military recruits), militaries will be hard-pressed to maintain force levels—especially if smaller native families are less willing to put their own children in harm’s way. Militaries will need to resort to creative expedients. They will outsource all non-vital functions. They will try substituting high-tech capital (robotics and unmanned craft) for labor. They may offer citizenship for service, hire overseas combatants (in effect, mercenaries) directly, or enter service alliances with friendly developing-country allies.

Implications: Many developed countries will be tempted to abandon military forces altogether, especially forces capable of large-scale combat, which will render them permanent free-riders on their allies. Countries retaining major forces, the United States foremost among them, will need to evaluate carefully the benefits against the high costs of labor-intensive security activities (such as occupation, nation-building, and counter-insurgency). Informal burden-sharing may give way to a more formal assessment of global levies—or to alliance-shattering declarations of isolationism or neutrality.

- *An aging developed world may lose its reputation for innovation and boldness—and struggle to remain culturally attractive and politically relevant to younger societies.*

Today’s liberal and democratic global order owes its durability not only to the developed countries’ capacity to defend it against aggressors, but more importantly to the positive global reputation of the developed countries themselves. Their mores and institutions embody this order. This is sometimes called the “soft power” of liberal democracy, which has widespread support both as a way of life and as a force in global affairs. All this may change if, as the developed world’s populations age, they are no longer regarded as progressive advocates for the future of all peoples, but rather as mere elder defenders of their own privileged hegemony. Illiberal “neo-authoritarian” regimes might then be able to win popularity as better advocates for rising generations. Ominously, history affords few (if any) examples of an aging civilization in demographic decline that has managed to preserve its global reputation and influence.

Implications. The consequences of the coming demographic transformation cannot be calibrated in mere population, productivity, or GDP numbers. The most important consequences may lie in the realm of culture and perception. By making full assimilation of immigrants work at home and by seeking out helpful relationships with younger national allies abroad, the developed countries may yet keep their liberal and democratic ideas fresh in the eyes of the world. If, on the other hand, the twenty-first century comes to be seen as the old, complacent,

infertile “them” versus the young, aspiring, fertile “us,” the challenge facing the developed world will be much more difficult.

A FRAMEWORK FOR POLICY ACTION

We conclude by laying out a framework for policy action organized around four broad strategies: (1) slowing demographic aging itself, and thus altering the fundamental demographic constraints on the geopolitical stature of the developed countries; (2) maximizing economic growth and efficiency, and thus mitigating the negative impact of any given degree of aging; (3) adapting diplomacy and strategic alliances to the emerging geopolitical landscape of the twenty-first century; and (4) adapting defense posture and military strategy to the new demographic realities. The developed countries will have to fashion effective policy responses in all four areas in order to meet the challenge of global aging.

Demographic Policy

- *Reward families for having children.* Although pronatal benefits alone are unlikely to have much impact on fertility, they may be effective as part of a comprehensive pronatal strategy that includes broader economic and labor-market reforms. To strengthen the pronatal tilt of existing benefit policies, developed-country governments could increase the size of per capita cash payments (or tax breaks) along with each child that a family has (as France does). They should also consider building new pronatal incentives into social insurance systems—either by linking payroll taxes (on the contributor side) or benefit payouts (on the beneficiary side) to the number of children people have.
- *Help women balance jobs and children.* Policies that help women (and men) balance jobs and children are the lynchpin of any effective pronatal strategy. Countries with low fertility rates and low rates of female labor-force participation will need to expand part-time work options, allow for flexible work hours, and provide for affordable daycare and adequate parental leave. More broadly, all countries will need to encourage flexible career patterns that allow parents to move in and out of employment to accommodate the cycles of family life.
- *Improve the economic prospects of young families.* In the end, no pronatal strategy will succeed unless governments also pursue broader reforms that improve the economic prospects of young families. One large impediment to family formation in the developed countries is the rising burden of intergenerational transfers from young to old. Two-tier labor markets are another. Reforms in both of these areas will have to be an integral part of any pronatal strategy.
- *Leverage immigration more effectively.* At least to some extent, higher rates of immigration can substitute for higher fertility rates. The faster that immigrants can be assimilated into the mainstream of society, the higher the immigration rate can be without triggering social and political backlash. Developed countries

without a tradition of assimilating immigrants will need to study best practices around the world, especially in the United States, Canada, and Australia.

Economic Policy

- *Reduce the projected cost of old-age benefits.* Any overall strategy to minimize the adverse economic impact of demographic aging must begin by reducing the rising cost of pay-as-you-go old-age benefit programs. There are many possible approaches. For pensions, governments can raise eligibility ages, “means-test” benefits, or introduce “demographic stabilizers” that directly index benefits to changes in the old-age dependency ratio. For health benefits, they can control costs by implementing a “global budget cap” for health spending and by researching and mandating best-practice standards.
- *Increase funded retirement savings.* As governments scale back pay-as-you-go benefits, they need to ensure that funded private pension savings fills the gap. Experience teaches that mandatory systems are far more effective at increasing savings and ensuring income adequacy than voluntary systems.
- *Encourage longer work lives.* Along with reducing fiscal burdens, aging societies need to increase workforce growth. Encouraging longer work lives will be crucial. The developed countries will need to raise eligibility ages for public pensions, revise policies (like seniority pay scales) that make older workers costly to hire or retain, encourage lifelong learning, and develop “flexible retirement” arrangements of all kinds.
- *Enable more young people to work.* While more older workers will help, younger workers have their own indispensable qualities. Governments, especially in Europe, will need to overhaul two-tier labor markets that lock in high levels of youth unemployment. Meanwhile, countries with low female labor-force participation must make it easier for women to balance jobs and family. With the right mix of policies, countries can have both higher female labor-force participation and higher fertility.
- *Maximize the advantages of trade.* Trade allows aging societies to benefit from labor in younger and faster-growing societies without the social costs of immigration. As technology increases the tradable share of the services economy, the potential for trade to raise living standards will grow. Yet so too will resistance to “outsourcing” on the part of aging workforces and electorates. Governments will need to pay special attention to developing policies that mitigate the adjustment costs.
- *Raise national savings.* Only adequate national savings can ensure adequate investment without the dangers of large and chronic current account deficits. Governments in aging societies will have to implement a comprehensive pro-savings agenda that includes everything from tax reform to entitlement reform.

Diplomacy and Strategic Alliances

- *Expand the developed-world club.* The future security of today's developed countries will increasingly depend on their success at building enduring strategic alliances with younger and faster-growing developing countries that share their liberal democratic values. The only way to keep the developed world's relative demographic, economic, and geopolitical stature from declining in the twenty-first century is to expand the membership of the developed-world club itself.
- *Prepare for a larger U.S. role.* As the population and economy of the United States grow relative to the rest of the developed world, so too will its role in security alliances. Leaders in the United States, Europe, and Japan need to acknowledge and prepare for this reality, while seeking ways to strengthen multilateralism.
- *Invest in development assistance.* Most of the countries of the developing world over the next few decades will be subject to enormous stresses from rapid demographic, economic, and social change. To help prevent these stresses from erupting into security threats, the developed countries need to develop long-term and cost-effective strategies of development aid and state-building assistance. A large investment could yield important results, but it may not be affordable unless the developed countries manage to control the rising cost of old-age benefits.
- *Remain vigilant to the threat of neo-authoritarianism.* As the demographic transition progresses and the stresses of development increase, the appeal of the neo-authoritarian model is likely to grow in many parts of the developing world. The developed countries must remain vigilant to the threat, continually monitor risks, and develop strategies to steer countries in the direction of liberal democracy.
- *Preserve and enhance soft power.* The developed countries now exercise enormous "soft power" throughout the world. To preserve and enhance it, they must make sure that they remain champions of the young and the aspiring—both at home and abroad. If domestically they persist in tilting the economy toward the old, and if internationally they are unwilling to commit substantial resources to helping young nations, the global appeal of their values and ideals will diminish.

Defense Posture and Military Strategy

- *Prepare for growing casualty aversion.* Defense planners must realize that youth will be considered a treasured asset in aging societies. Developing effective communication strategies to persuade the public that military actions which put youth at risk are justified will need to become an integral part of the planning process.
- *Substitute military technology for manpower.* Developed-country militaries, of course, are already doing a lot of this, and they will need to do even more of it in the future. Substituting technology for manpower, however, is a strategy with limitations. Manpower will always be needed—for occupation and pacification, for nation-building, and, in the event it happens, for large-scale conventional war.

- *Substitute nonnative for native manpower.* As recruitment pools shrink, the developed countries will increasingly need to substitute nonnative for native manpower. The challenge will be to minimize the risks associated with this strategy. The worst approach is to hire freelance mercenaries (whether foreign or domestic). The best may be to offer immigrants citizenship in return for service—perhaps, as Max Boot suggests, actively recruiting potential immigrants abroad.⁵
- *Create “service alliances” with loyal developing countries.* Another way to substitute nonnative for native manpower is to create “service alliances” with loyal developing-country allies that are willing to supply troops in exchange for aid or technology. Developed-country militaries would need to train and equip the troops to developed-country standards.
- *Adapt weapons, training, and force structure.* Demographic trends will influence both the types of locales in which militaries will be called on to fight and the types of missions they will be called on to execute. Warfare will be increasingly urban; nation-building will be as important as battlefield victory; and expertise in “exotic” languages and familiarity with foreign cultures will be essential. Weapons, training, and force structure must be adapted accordingly. It may make sense to develop a special nation-building force—or what Thomas Barnett calls a SysAdmin Force.⁶

In the decades to come, the world will witness a sweeping demographic transformation never before seen in history. The rapid aging of today’s developed countries threatens to undermine their ability to maintain national and global security—even as demographic trends in the developing world will give rise to serious new threats. Meeting the challenge will require discipline, leadership and a wide-ranging and long-term agenda.

To the extent that it can, the developed world should try to modify the demographic outcome through family formation and immigration policies that are consistent with its deeply held liberal democratic values. As the transformation proceeds, it will need to take special care to enhance and preserve the performance of its economies—by making sure that they remain flexible, open to new innovations, and generate enough savings to ensure a future of rising living standards for younger generations. In its dealings with the rest of the world, the developed world will need to be forward-looking and open to the membership of new societies that share its basic values—as well as vigilant about countries that may respond to rapid demographic change in authoritarian ways. As always, the security and authority of the developed world will depend on its ability to defend itself. This will require creative solutions if it is to protect its scarce youth from needless risks, while filling a broader range of likely missions. Here too, part of the solution will be to build relationships with younger societies willing to join us as allies.

⁵ Max Boot and Michael O’Hanlon, “A Military Path to Citizenship,” *The Washington Post*, October 19, 2006.

⁶ Thomas P. M. Barnett, *Blueprint for Action: A Future Worth Creating* (New York: Berkley Books, 2005).

Well into the twenty-first century, the United States will be fated by demography to be a leader. It will not only have to continue shouldering the level of global responsibility that it has in recent decades, but in all likelihood will have to assume even greater responsibility. In a world of graying great powers, the United States will be even more indispensable.

Appendix One

Technical Notes

Appendix 1 briefly describes the assumptions and methodology underlying the demographic, fiscal, and economic projections discussed in this report. It also includes information on data sources, indicator definitions, and country groupings.

1. PRINCIPAL DATA SOURCES

Basic demographic data, both historical and projected, come from the UN Population Division and are published in *World Population Prospects*.¹ These include total population, population by age and sex, median age, total fertility rates, and life expectancy. We also consulted numerous additional sources for specific historical data series (for instance, for age-specific fertility rates, age-specific mortality rates, and the foreign-born stock), as well as additional projections (for instance, for urbanization and AIDS). These sources are cited in the report's footnotes.

The basic economic data come from standard international sources. Historical data for GDP and GDP per capita in purchasing power parity (PPP) dollars are from the World Bank's *World Development Indicators* (WDI),² but were updated by CSIS based on the preliminary results of the 2005 International Comparison Program (ICP).³ For countries where ICP did not conduct price surveys, PPP conversion rates are from WDI or the International Monetary Fund's World Economic Outlook Database (WEO).⁴ For some countries where neither WDI nor WEO provide historical GDP data, CSIS referred to data published online by Angus Maddison of the University of Groningen.⁵ Labor-force data (for employment and labor-force participation, by age and sex) come from the OECD.Stat database⁶ for OECD member countries. For non-OECD countries, they come from WDI and the International Labor Organization's LABORSTAT database.⁷

Most of the basic fiscal data also come from standard international sources. The historical data for government expenditures on public pensions come from the

¹ *World Population Prospects: The 2006 Revision* (New York: UN Population Division, 2007).

² World Development Indicators 2007, The World Bank, 2007, <http://devdata.worldbank.org/dataonline/>.

³ *2005 International Comparison Program: Preliminary Results* (Washington, DC: International Comparison Program and The World Bank, December 2007).

⁴ World Economic Outlook Database, International Monetary Fund, October 2007, <http://www.imf.org/>.

⁵ Angus Maddison, World Population, GDP and Per Capita GDP, 1-2003 AD, August 2007, <http://www.ggdc.net/maddison/>.

⁶ OECD.Stat, OECD, <http://stat.oecd.org/>.

⁷ LABORSTAT, International Labor Organization, <http://laborsta.ilo.org/>.

European Commission for EU-member countries⁸ and from the OECD Social Expenditure Database (SOCX) for other countries.⁹ Data on health-care spending (both public and private) also come from OECD and are published in OECD Health Data.¹⁰ Data for government expenditure for national defense are from the International Institute for Strategic Studies and are published in *The Military Balance*.¹¹

2. DEMOGRAPHIC INDICATORS AND COUNTRY GROUPS

Demographic Indicators

- The three major age groups—children, working-age adults, and elderly—are defined as the population aged 0 to 19, aged 20 to 64, and aged 65 and over, respectively.
- The three demographic dependency ratios—child, old-age, and total—are defined as the number of children per 100 working-age adults, the number of elderly per 100 working-age adults, and the number of children and elderly per 100 working-age population, respectively.
- A youth bulge is defined as the population aged 15 to 24 as a share of the total adult population aged 15 and over.
- Fertility rates and life expectancy, unless otherwise indicated, refer to five year averages.

Country Groups

The country groups referred to in this report reflect our understanding of relevant economic, cultural, and geopolitical ties among nations. They therefore differ (in some cases significantly) from the purely geographical classifications used by the UN. Figure A-1 provides a complete list of the members of each country group.

Figure A-1: Country Group Definitions

Developing World	Developed World
Sub-Saharan Africa	United States
Arab World	Other English-Speaking Countries
Non-Arab Muslim Asia	Western Europe
China & East Asia	Japan
India & South Asia	
Latin America	
Russian Sphere	
Eastern Europe	

⁸ “The Impact of Aging on Public Expenditure: Projections for the EU25 Member States on Pensions, Health Care, Long-Term Care, Education and Unemployment Transfers (2004-2050),” *European Economy*, Special Reports, no 1/2006 (Brussels: European Commission, 2006).

⁹ Social Expenditure Database (SOCX), 1980-2003 (Paris: OECD, 2007).

¹⁰ OECD Health Data 2007 (Paris: OECD, 2007).

¹¹ International Institute for Strategic Studies, *The Military Balance* (London: Routledge, various years).

Sub-Saharan Africa

Angola	Gabon	Réunion
Benin	Gambia	Rwanda
Botswana	Ghana	Saint Helena
Burkina Faso	Guinea	São Tomé & Príncipe
Burundi	Guinea-Bissau	Senegal
Cameroon	Kenya	Seychelles
Cape Verde	Lesotho	Sierra Leone
Central African Republic	Liberia	South Africa
Chad	Madagascar	Swaziland
Comoros	Malawi	Togo
Congo	Mali	Uganda
Côte d'Ivoire	Mauritius	Tanzania
Dem. Rep. Congo	Mozambique	Zambia
Equatorial Guinea	Namibia	Zimbabwe
Eritrea	Niger	
Ethiopia	Nigeria	

Arab World

Algeria	Lebanon	Somalia
Bahrain	Libya	Sudan
Djibouti	Mauritania	Syria
Egypt	Morocco	Tunisia
Iraq	Occupied Palestinian Territory	United Arab Emirates
Israel	Oman	Western Sahara
Jordan	Qatar	Yemen
Kuwait	Saudi Arabia	

Non-Arab Muslim Asia

Afghanistan	Iran	Pakistan
Azerbaijan	Kazakhstan	Tajikistan
Bangladesh	Kyrgyzstan	Turkey
Brunei Darussalam	Malaysia	Turkmenistan
Indonesia	Maldives	Uzbekistan

China & East Asia

China	Mongolia	Singapore
Hong Kong SAR	North Korea	
Macao SAR	South Korea	

India & South Asia

Bhutan	Micronesia	Sri Lanka
Cambodia	Myanmar	Thailand
India	Nepal	Timor-Leste
Laos	Philippines	Viet Nam
Melanesia	Polynesia	

Russian Sphere

Armenia	Georgia	Russian Federation
Belarus	Moldova	Ukraine

Eastern Europe

Albania	Estonia	Poland
Bosnia & Herzegovina	Greece	Romania
Bulgaria	Hungary	Serbia
Croatia	Latvia	Slovakia

Cyprus Czech Republic	Lithuania Montenegro	Slovenia Macedonia
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Latin America

Argentina	El Salvador	Panama
Belize	Falkland Islands	Paraguay
Bolivia	French Guiana	Peru
Brazil	Guatemala	Puerto Rico
Chile	Guyana	Suriname
Colombia	Haiti	Uruguay
Costa Rica	Honduras	Venezuela
Cuba	Jamaica	Rest of the Caribbean
Dominican Republic	Mexico	
Ecuador	Nicaragua	

United States

United States

Other English-Speaking Countries

Australia	Channel Islands	New Zealand
Bermuda	Ireland	United Kingdom
Canada	Isle of Man	

Western Europe

High-Fertility Zone	Netherlands	Liechtenstein
Belgium	Norway	Malta
Denmark	Saint-Pierre-et-Miquelon	Monaco
Faeroe Islands		Portugal
Finland	Low-Fertility Zone	San Marino
France	Andorra	Spain
Gibraltar	Austria	Sweden
Greenland	Germany	Switzerland
Iceland	Holy See	
Luxembourg	Italy	

Japan

Japan

3. DEMOGRAPHIC PROJECTIONS**Baseline Projections**

For the developed countries, the population projections used in this report refer to the UN's (2006 Revision) "constant fertility" variant. For the developing countries, they refer either to the UN's constant fertility variant or to its "high fertility" variant. We use the high variant for those countries whose current fertility rate (or more precisely, the UN's estimate for its average fertility rate between 2000 and 2005) is above 2.35, the high variant's ultimate fertility assumption. This includes nearly all of sub-Saharan Africa and the Arab world, as well as most of non-Arab Muslim Asia, South Asia, and Latin America. For countries whose current fertility rate is already lower than 2.35, we use the constant variant, just as we do for the developed countries. This includes all of East Asia, Eastern Europe, and the Russian sphere.

Figure A-2 lists the regions or individual countries where the constant fertility scenario is used. See Chapter 4 for a discussion of our projection choices.

Figure A-2: Developing Countries Where “Constant Variant” is Used

China & East Asia All countries	Cuba Falkland Islands Puerto Rico	Sri Lanka Thailand Viet Nam
Russian Sphere All countries	Uruguay Rest of the Caribbean	Arab World Kuwait
Eastern Europe All countries	Non-Arab Muslim Asia Azerbaijan	Lebanon Tunisia
Latin America Argentina Brazil Chile Costa Rica	Iran Kazakhstan Turkey	Sub-Saharan Africa Mauritius
	India & South Asia Myanmar	

For reference, we include a table at the end of Appendix 1 comparing key demographic indicators for the developing countries under three different projections: the UN’s “medium fertility” variant, its constant fertility variant, and the CSIS-defined baseline described above. (See Figure A-5.)

Sensitivity Analysis

In preparing this report, we conducted extensive sensitivity analysis of the demographic projections using the DemoTools cohort component projection software package. Some of the alternative projections we generated (for instance, the constant-mortality rate projection for Russia) are referred to in the report. We also made use of three special projection scenarios published by the UN: the “instant-replacement-fertility” scenario, (which assumes that the fertility rate immediately rises—or falls—to the replacement rate in all countries); the “zero-net-migration” scenario (which assumes that net immigration or emigration immediately falls to zero in all countries); and the “no-AIDS” scenario (which assumes that there neither has been nor will be any mortality from AIDS).

Projections of Muslim Populations

The report includes projections of the Muslim populations for France, Germany, and Russia to 2050 (“Muslim” typically being defined as ultimate nationality of origin rather than religious practice, the data for which are unavailable). We begin with widely used estimates for the Muslim share of national populations in 2005: 8.3 percent in France, 3.5 percent in Germany, and 14.0 percent in Russia. We estimate annual net Muslim immigration for these countries in 2005 at 120,000, 150,000, and 150,000, respectively; and we assume that the ratio of net immigration to immigrant population will remain constant in future years. We estimate the fertility rate of the Muslim populations in 2005 at 2.75, 2.50, and 2.50, respectively, and assume that it

will drop to 2.25 in all countries no later than 2030. After matching fertility rates and age profiles with annual growth rates through a standard demographic model and then adding immigration, we derive annual future Muslim population numbers. We assume that immigration does not alter the total future population in each country given by the baseline projection used in the report.

4. CSIS “CURRENT DEAL” PROJECTION

The “current deal” projection discussed in Chapter 2 assumes that the overall generosity of public pensions and health benefits to the elderly will remain unchanged in the future. The projection was made as follows:

For pensions, we assume: first, that future retirees will begin to collect benefits at the same average age they do today; and second, that per capita benefits will remain constant relative to per-worker wages. The spending projections are thus determined by the projected change in the old-age dependency ratio. Pensions include all government spending on old-age, special early retirement, and survivors benefits. Base-year data are from the European Commission and OECD (see above for sources).

For health benefits, we first allocate total public spending by age.¹² Health benefits to the elderly are then projected based on two assumptions. The first is that current age-bracket differentials in per capita health spending will remain unchanged in the future. The second is that age-adjusted per capita health spending in each country will initially grow at its average historical rate (a 25-year weighted average), but that it will converge linearly by 2050 to the rate of growth in real GDP per capita plus 1 percent (which is roughly the 25-year weighted average for all developed countries). Base-year data come from OECD Health Data (see above).

The base-year for all of CSIS’ fiscal and economic projections is 2005, the latest year for which most demographic, fiscal, and economic data are available. When data for 2005 were not available, the latest data were trended to 2005.

5. ECONOMIC PROJECTIONS

Global GDP Projection Model

The global GDP projections introduced in Chapter 5 are based on a stylized convergence model developed especially for this report. The model projects real GDP and GDP per capita (in purchasing power parity dollars) based on: (a) the baseline population projection used in this report; (b) an assumption of constant labor-force participation rates; and (c) an assumption of long-term convergence in growth rates

¹² For most countries, we use unpublished data on per capita spending by age made available to CSIS by the OECD Economics Department. For Canada and Japan, data come from OECD Health Data 2007 (Paris: OECD, 2007); and “National Health-Care Expenditure for the Fiscal Year 2004,” The Ministry of Health, Labor, and Welfare, Japan, August 25, 2006, [http:// www.mhlw.go.jp/](http://www.mhlw.go.jp/). For countries where no age bracket data were available, we use the averages for other countries in the same region.

in GDP per employed person across countries; and (d) a milder assumption of absolute convergence in living standards across countries.

The model projects employment as follows. For the developed countries, as well as China, Russia, India, and Brazil, it generates employment by applying current (generally 2005) labor-force participation rates by age and sex to the projected future population in each year. For other countries, where detailed labor-force data is not generally available, it makes the simplifying assumption that employment will remain constant as a share of the working-age population.

The model projects the growth rate in GDP per employed person as follows. First, it assumes that GDP per employed person will initially grow at its average historical rate over the past 10 years in each country. The average is estimated as the slope in log real GDP per worker between 1995 and 2005. Growth rates in GDP per employed person in all countries are then assumed to gradually converge (up or down) to 1.5 percent per year—roughly the developed-country average over the past 25 years (1980 to 2005). Starting in 2010, the gap between the initial growth rate in GDP per employed person in each country and the developed-country historical average (1.5 percent) is cut in half every 20 years. As for absolute level convergence, the model cuts the gap between the level of real GDP per employed person in each country and the level in the United States by 1 percent per year. The second convergence formula is phased in from 2010 to 2020.

The population projections and historical GDP, employment, and labor-force participation data used in constructing the model are all described above. See Figures A-3 and A-4 for summary model results.

Developed-Country GDP Scenarios

The GDP scenarios discussed in Chapter 2 were developed separately from our global GDP projection model and serve a different purpose: to isolate the impact of demographic trends on future GDP growth and to compare the impact across different countries. To facilitate comparison, we assume the same constant productivity growth rate in all countries—1.5 percent per year in all of the scenarios except the “low productivity” scenario, where the rate is 1.0. The “baseline” scenario assumes that labor-force participation rates by sex and age will remain constant in the future, except to allow for a cohort effect in female labor-force participation.¹³ The “higher-retirement-age” scenario assumes that retirement ages will rise by five years, with the increase phased in linearly between 2005 and 2030. The higher female labor-force participation scenario assumes that age-specific female labor-force participation rates will reach 95 percent of the corresponding male rates by 2030, again with the increases phased in linearly. The historical employment growth scenario assumes that future employment will grow at the average employment growth rate in each country over the past 45 years.

¹³ In other words, we assume that rising labor-force participation at younger ages will eventually lead to rising participation at older ages. For instance, if the labor-force participation rate for women aged 30 to 34 increased by 2 percent between 2000 and 2005, we assume that the participation rate for women aged 35 to 39 will increase by 2 percent between 2005 and 2010.

Figure A-3: GDP by Region (in 2005 PPP Dollars), as a Percent of World Total, 2005-2050

	2005	2010	2020	2030	2040	2050
Developing World	46	50	56	62	66	69
Sub-Saharan Africa	2	2	3	3	4	4
Arab World	4	4	4	4	4	4
Non-Arab Muslim Asia	5	5	5	6	6	6
China & East Asia	13	16	22	26	28	29
India & South Asia	6	7	9	10	12	14
Latin America	8	8	7	7	6	6
Russian Sphere	4	4	4	3	3	3
Eastern Europe	3	3	3	3	3	2
Developed World	54	50	44	38	34	31
United States	22	22	20	19	18	17
Other English-Speaking World	7	7	6	5	5	4
Western Europe	17	16	12	10	8	7
Japan	7	6	5	4	3	3

Figure A-4: GDP Per Capita by Region (in 2005 PPP Dollars), as a Percent of U.S. GDP Per Capita, 2005-2050

	2005	2010	2020	2030	2040	2050
Developing World	11	12	14	16	18	19
Sub-Saharan Africa	4	4	4	5	5	6
Arab World	16	16	15	15	16	16
Non-Arab Muslim Asia	9	9	9	10	10	11
China & East Asia	13	16	25	34	43	51
India & South Asia	6	6	8	10	12	13
Latin America	21	19	18	18	18	18
Russia Sphere	24	27	32	39	44	46
Eastern Europe	32	36	43	51	56	57
Developed World	83	81	79	79	78	79
United States	100	100	100	100	100	100
Other English-Speaking World	78	77	77	77	77	77
Western Europe	72	68	63	59	57	57
Japan	73	69	66	67	64	63

Figure A-5: Developing-World Demographic Indicators: CSIS-Defined Baseline vs. UN Medium and Constant Fertility Variants

	Fertility Variant	Youth Bulge Share			Total Dependency Ratio			Elderly Share			Median Age			Population Growth	
		2005	2025	2050	2005	2025	2050	2005	2025	2050	2005	2025	2050	2005-50	2050-50
Developing World	CSIS	27%	22%	19%	85	79	81	6.0%	8.7%	13.5%	26.3	30.2	34.1	62%	
	UN Medium	27%	21%	17%	85	73	73	6.0%	9.0%	15.1%	26.3	31.4	37.2	46%	
	UN Constant	27%	22%	23%	85	84	101	6.0%	8.5%	11.4%	26.3	29.3	29.0	93%	
Sub-Saharan Africa	CSIS	36%	34%	28%	136	122	91	3.1%	3.4%	4.9%	18.0	19.4	24.1	164%	
	UN Medium	36%	33%	26%	136	112	80	3.1%	3.6%	5.6%	18.0	20.5	26.5	130%	
	UN Constant	36%	34%	35%	136	138	144	3.1%	3.2%	3.4%	18.0	17.7	17.3	287%	
Arab World	CSIS	32%	25%	21%	100	88	81	4.0%	5.7%	10.6%	22.1	26.0	30.7	114%	
	UN Medium	32%	25%	19%	100	78	71	4.0%	6.0%	12.3%	22.1	27.6	34.5	84%	
	UN Constant	32%	26%	25%	100	96	106	4.0%	5.5%	8.5%	22.1	24.6	25.0	167%	
Non-Arab Muslim Asia	CSIS	30%	23%	20%	91	79	79	4.6%	6.7%	12.1%	23.6	28.6	32.7	81%	
	UN Medium	30%	22%	17%	91	71	70	4.6%	7.1%	14.0%	23.6	30.1	36.8	57%	
	UN Constant	30%	23%	22%	91	83	94	4.6%	6.6%	10.7%	23.6	27.7	28.9	106%	
China & East Asia	CSIS	21%	14%	11%	61	58	78	7.7%	14.1%	25.2%	32.6	40.1	47.4	2%	
	UN Medium	21%	14%	13%	61	60	80	7.7%	13.9%	24.0%	32.6	39.6	45.3	7%	
	UN Constant	21%	14%	11%	61	58	78	7.7%	14.1%	25.2%	32.6	40.1	47.4	2%	
India & South Asia	CSIS	29%	23%	19%	91	79	75	5.0%	7.5%	12.6%	24.1	28.7	33.9	71%	
	UN Medium	29%	22%	16%	91	70	65	5.0%	8.0%	14.8%	24.1	30.3	38.6	45%	
	UN Constant	29%	23%	22%	91	85	91	5.0%	7.3%	10.8%	24.1	27.6	29.1	100%	
Latin America	CSIS	27%	21%	18%	84	78	84	6.3%	9.9%	16.0%	26.0	31.0	35.1	60%	
	UN Medium	27%	20%	15%	84	70	75	6.3%	10.3%	18.5%	26.0	32.5	40.1	38%	
	UN Constant	27%	21%	19%	84	79	90	6.3%	9.8%	15.2%	26.0	30.8	33.4	68%	
Russian Sphere	CSIS	20%	13%	10%	61	58	72	14.3%	17.8%	26.9%	37.5	42.6	49.9	-33%	
	UN Medium	20%	13%	11%	61	61	79	14.3%	17.6%	24.7%	37.5	42.2	46.6	-27%	
	UN Constant	20%	13%	10%	61	58	72	14.3%	17.8%	26.9%	37.5	42.6	49.9	-33%	
Eastern Europe	CSIS	18%	12%	9%	61	64	85	14.5%	20.6%	31.0%	37.5	44.5	52.2	-22%	
	UN Medium	18%	12%	11%	61	65	89	14.5%	20.4%	29.3%	37.5	44.2	50.0	-17%	
	UN Constant	18%	12%	9%	61	64	85	14.5%	20.6%	31.0%	37.5	44.5	52.2	-22%	

Appendix Two

Roundtable and Interviews

On September 20, 2006 CSIS hosted a roundtable on demography and geopolitics that brought together a diverse group of about 15 demographers, economists, historians, and security experts for a day-long discussion of the issues at the heart of this report. We also interviewed dozens of additional policy leaders and thought leaders in person or over the phone between October 2006 and December 2007. These discussions provided invaluable insights that have helped to shape our thinking on many issues. The views expressed in this report, however, are those of the authors alone.

Roundtable Participants

Jon B. Alterman, *Director and Senior Fellow, Middle East Program, Center for Strategic and International Studies*

Gary Burtless, *Senior Fellow, Economic Studies, Brookings Institution*

Richard P. Cincotta, *Demographer, Long Range Analysis Unit, National Intelligence Council*

Joseph Cyruk, *Senior Military Analyst, Office of Transnational Issues, Central Intelligence Agency*

Nicholas Eberstadt, *Henry Wendt Chair in Political Economy, American Enterprise Institute*

Jack Goldstone, *Professor of Public Policy, School of Public Policy, George Mason University*

John R. Landry, *National Intelligence Officer for Military Issues, National Intelligence Council*

Michael Mandelbaum, *Professor of American Foreign Policy, School of Advanced International Studies, Johns Hopkins University*

Brian Nichiporuk, *Political Scientist, RAND Corporation*

Barry Pavel, *Principal Director for Policy Planning, Office of the Secretary of Defense, Department of Defense*

Betsy Quint-Moran, *Deputy Chief, CoLab*

Sharon Stanton Russell, *Senior Research Scholar, Center for International Studies, Massachusetts Institute of Technology*

Sylvester J. Schieber, *Vice President and Director, Research and Information Center, Wyatt Worldwide*

Michael S. Teitelbaum, *Vice President, Sloan Foundation*

Henrik Urdal, *Senior Researcher, Centre for the Study of Civil War, International Peace Research Institute, Oslo*

Enders Wimbush, *Director and Senior Fellow, Center for Future Security Strategies, Hudson Institute*

Interviewees

W. Andrew Achenbaum, *Professor of History, University of Houston*

Robert Art, *Professor of International Relations, Brandeis University*

Thomas P.M. Barnett, *Senior Managing Director, Enterra Solutions*

Robert H. Binstock, *Professor of Sociology, Case Western Reserve University*

John Bongaarts, *Vice President and Distinguished Scholar, Population Council*

Philippe Bourcier de Carbon, *former Senior Researcher, Institut National Études Démographiques*

Barry Buzan, *Professor of International Relations, London School of Economics*

Bill Carr, *Deputy Undersecretary of Defense for Military Personnel Policy, U.S. Department of Defense*

John Casterline, *Professor of Sociology, Ohio State University*

Jean-Claude Chesnais, *Senior Researcher, Institut National Études Démographiques*

David Coleman, *Professor of Demography, Oxford University*

Jean-Philippe Cotis, *Chief Economist, OECD*

Paul Demeny, *Distinguished Scholar, Population Council*

Douglas Downey, *Professor of Sociology, Ohio State University*

Murray Feshbach, *Senior Scholar, Woodrow Wilson Center*

Benjamin M. Friedman, *Professor of Political Economy, Harvard University*

George Freidman, *Chairman, Strategic Forecasting, Inc.*

Tomas Frejka, *International Consultant and Demographer*

Richard Gill, *former Professor of Economics, Harvard University*

Curtis Gilroy, *Director of Accession Policy, Office of the Undersecretary of Defense for Personnel and Readiness, U.S. Department of Defense*

Norval D. Glenn, *Professor of Sociology, University of Texas at Austin*

David Gordon, *Director of Policy Planning, U.S. State Department*

Gordon M. Hahn, *Senior Researcher, Center for Terrorism and Intelligence Studies*

Victor Davis Hanson, *Senior Fellow, Hoover Institution*

Harry Harding, *Professor of International Affairs, Elliot School of International Affairs, George Washington University*

Gunnar Heinsohn, *Professor of Sociology, University of Bremen*

Peter S. Heller, *former Deputy Director for Fiscal Affairs, International Monetary Fund*

Graeme P. Herd, *Associate Fellow, International Security Program, Chatham House*

Andy Hoehn, *Vice President, RAND Corporation*

Valerie Hudson, *Professor of Political Science, Brigham Young University*

Robert L. Hutchings, *former Chairman, U.S. National Intelligence Council*

Philip Jenkins, *Professor of History and Religious Studies, Pennsylvania State University*

- Robert Jervis, *Professor of International Affairs, Columbia University*
- Robert D. Kaplan, *Senior Fellow, Center for a New American Security*
- Eric Kaufmann, *Reader in Politics and Sociology, Birkbeck College, University of London*
- Paul Kennedy, *Professor of History, Yale University*
- Hans-Peter Kohler, *Professor of Sociology, University of Pennsylvania*
- James Kurth, *Professor of Political Science, Swarthmore College*
- Christian Leuprecht, *Assistant Professor of Political Science, Royal Military College of Canada*
- Phillip Longman, *Senior Fellow, New America Foundation*
- Wolfgang Lutz, *Leader, World Population Program, International Institute for Applied Systems Analysis*
- Charles S. Maier, *Professor of History, Harvard University*
- Andrew Marshall, *Director, Office of Net Assessment, U.S. Department of Defense*
- Mara Mather, *Associate Professor of Psychology, University of California, Santa Cruz*
- Robert R. McCrae, *Senior Investigator, National Institute on Aging*
- Peter McDonald, *Professor of Demography, Australian National University*
- Harry R. Moody, *Director of Academic Affairs, AARP*
- Joseph S. Nye, *Professor of International Relations, Harvard University*
- Ceri Peach, *Professor of Social Geography, Oxford University*
- Ellen Peters, *Senior Research Scientist, Decision Research*
- Richard A. Posner, *Judge, United States Seventh Circuit Court of Appeals*
- Steven Rosen, *Professor of National Security and Military Affairs, Harvard University*
- Bernie Rostker, *Senior Fellow, RAND Corporation*
- Catherine Salmon, *Assistant Professor of Psychology, University of Redlands*
- Rickard Sandell, *Senior Research Fellow, Madrid Institute for Advanced Studies*
- Timothy M. Savage, *Division Chief, Office of European Analysis, U.S. State Department*
- James R. Schlesinger, *Chairman, MITRE Corporation*
- David Shapiro, *Professor of Demography, Pennsylvania State University*
- Dean Keith Simonton, *Professor of Psychology, University of California, Davis*
- Frank J. Sulloway, *Visiting Scholar, University of California, Berkeley*
- William R. Thompson, *Professor of Political Science, Indiana University*
- Monica Toft, *Associate Professor of Public Policy, John F. Kennedy School of Government, Harvard University*
- Lt. Gen. Robert Van Antwerp, *former Commanding General, U.S. Army Accessions Command*
- Peter Uhlenberg, *Professor of Sociology, University of North Carolina*
- Alan Walker, *Professor of Social Policy, University of Sheffield*
- Kenneth N. Waltz, *Senior Research Scholar, Columbia University*

Stephen Walt, *Professor of International Relations, John F. Kennedy School of Government, Harvard University*

John R. Weeks, *Professor of Geography, San Diego State University*

Charles Westoff, *Professor of Demographic Studies and Sociology, Princeton University*

David Willetts, *Member of Parliament, Havant, United Kingdom*

Cindy Williams, *Principal Research Scientist, Security Studies Program, Massachusetts Institute of Technology*

William C. Wohlforth, *Professor of Government, Dartmouth College*

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Richard Jackson
Neil Howe

March 2008

About the Authors

Richard Jackson writes on public policy issues arising from the aging of America's and the world's population. He is currently a Senior Fellow at CSIS, where he directs the Global Aging Initiative, an Adjunct Fellow at the Hudson Institute, and a Senior Advisor to the Concord Coalition. Jackson is the author of numerous studies on the implications of population aging in countries around the world, including *The Global Retirement Crisis* (2002); *The Aging Vulnerability Index* (2003); *The Graying of the Middle Kingdom* (2004), *Building Human Capital in an Aging Mexico* (2005); and *The Aging of Korea* (2007). Jackson regularly speaks on long-term demographic and economic issues and is often quoted in the press. He holds a B.A. in classics from SUNY at Albany and a Ph.D. in economic history from Yale University. He lives in Alexandria, VA with his wife Perrine and three children, Benjamin, Brian, and Penelope.

Neil Howe is a historian, economist, and demographer who writes and speaks frequently on the aging of the population, long-term fiscal policy, and generations in history. He is a Senior Associate at CSIS, where he works with the Global Aging Initiative, Senior Policy Advisor to the Blackstone Group, and a Senior Advisor to the Concord Coalition. He is also cofounder of LifeCourse Associates, a marketing, HR, and strategic planning consultancy serving corporate, government, and nonprofit clients. Howe is the author of numerous policy studies and books, including *On Borrowed Time* (1998), *Generations* (1991), *13th-Gen* (1993), *The Fourth Turning* (1997), and *Millennials Rising* (2000). He holds graduate degrees in history and economics from Yale University. He lives in Great Falls, Virginia, with his wife Simona and two children, Georgia and Nathaniel.

CSIS | CENTER FOR STRATEGIC &
INTERNATIONAL STUDIES

1800 K STREET NW
WASHINGTON, DC 20006
TEL: (202) 887-0200
FAX: (202) 775-3199
WWW.CSIS.ORG