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BY RICHARD SHEDIAC, CHADI N. MOUJAES, AND MAZEN RAMSAY NAJJAR

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Most people generally recognize the role that demographic trends play in shaping societies, mature economies, emerging markets, and the environment. China and India, for example, have become immense economic engines in part because each has more than a billion people. A bulge in the youth population has been a major factor in the recent unrest in the Middle East: Young people are compelled to protest because they feel they deserve opportunities and a voice in society that reflects the strength of their numbers. Europe and Japan, conversely, are known to be suffering economically because of their aging workforces: The proportion of people who are retired, and thus dependent on others to support them, is rapidly increasing.

The conventional wisdom says that there's nothing one can do about these kinds of demographic trends, that every country must live with its demographic destiny. But that isn't true. Political and business leaders can do a great deal, if they are willing to take a precise approach to prediction; past and present demographic trends, as well as those expected for the near future, can help them calculate socioeconomic trajectories. In the public sector, the first step is to pinpoint a country's development trajectory and demographic profile; next, plot the potential for social, economic, and environmental progress; then, look for challenges and opportunities; finally, develop policies and actions to improve the country's trajectory. Companies can use a similar approach to take advantage of demographic trends in countries where they hope to find new sources of talent or potential consumers.

This proactive approach to demographics is un-

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derpinned by two analytical concepts. The *dependency curve* shows the relationship between a country's working and nonworking populations over time. The *arc of growth* shows the pattern of momentum as a country's prosperity increases while its population ages. With a better understanding of the dependency curve and the arc of growth, and with strategies attuned to their stage of demographic development, country leaders can determine the rate at which their workforce is aging and prepare accordingly: creating a self-sustaining future, avoiding long-term insolvency, and improving quality of life for generations to come. The strictures of demographics don't have to be destiny.

The Dependency Curve

In 1950, the world's population was only about 2 billion. Then the post–World War II baby boom, as well as significant strides in healthcare and a relatively low level of warfare, created a spike in population growth and reduced the death rate. These demographic trends led to a larger workforce, higher standards of living, and greater equality.

This shift influenced individuals' behavior and the structure of families. As standards of living rose, people began to have fewer children, in part to maintain their standard of living more easily, and in part because there was greater access to and acceptance of birth control. Women's mass entry into the workforce put additional downward pressure on the birthrate. This dynamic began in Western countries in the 1960s and has since spread around the world. Between 1950 and 1980, average annual population growth globally was 1.89 percent. Growth rates began to fall between 1970 and 1980, and the overall growth rate for the period between 1980 and 2010 was 1.47 percent. From 2010 to 2050, growth is expected to fall to 0.71 percent.

The deceleration means that the average age of the global population will rise at an increasing rate over the next 50 years. In 1950, 34.1 percent of the planet's inhabitants were younger than 15 and only 5.2 percent were older than 64. Today, the younger group has shrunk to 26.9 percent and the older group has grown to 7.6 percent. By 2050, the younger group will slide to 19.6 percent of the population and the older group will more than double, to 16.2 percent. (See Exhibit 1.)

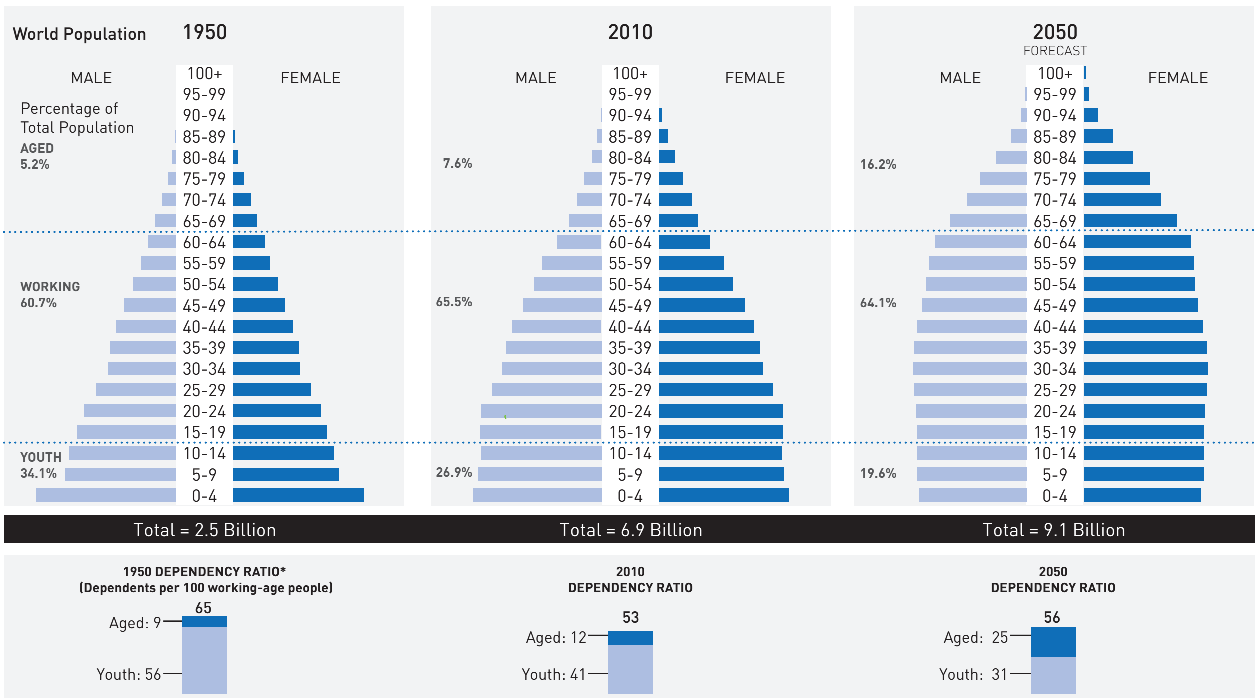
Every country seems to go through a similar cycle as its economy matures, the balance shifting between working-age (younger) and retirement-age (older) cohorts. Exhibit 2 shows this dependency curve in both its generic form and the way it has played out in several different countries. The change begins with a baby boom — a relatively high number of young children, with a high level of dependence on parents. As these children mature into young adults, the country experiences a time of overall peak earning power. It is after youth dependency has started to decline but before the dependency of the older population has become too acute. This can produce what demographer David E. Bloom has called a demographic dividend: a burst of prosperity, lasting a decade or more, brought on by the creativity and energy of so many young entrepreneurs and workers. Countries can reap this dividend only if government policies have readied the country's workforce with the proper education, infrastructure, and policies to maximize their economic potential.

Sooner or later, however, families have fewer children and the population gets older. The dependency rates rise, this time permanently. From 1950 to 2010,

The world is at an inflection point: The global dependency ratio is still relatively low, but it will rapidly increase as the average age of the population rises.

Exhibit 1: **The Aging Global Population, 1950–2050**

The percentage of older people (age 65 plus) in the total world population has been steadily increasing since 1950, and it will continue to do so while the percentage of young people declines.



*Overall dependency is the sum of the youth and aged dependencies. Youth dependency is the ratio of youth (0–14) to working-age population (15–64), and aged dependency is the ratio of aged (65+) to working-age population.

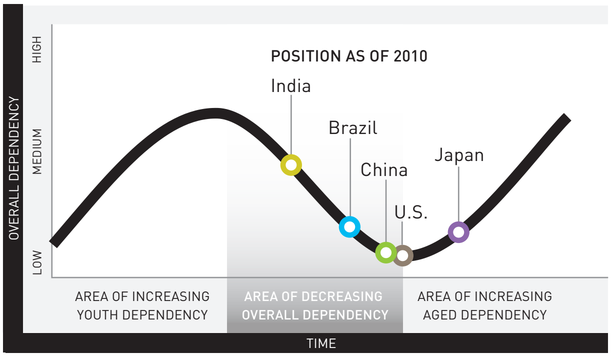
Source: U.N. Population Division, "World Population Prospects: The 2008 Revision" and "World Population Prospects: The 2010 Revision"

the global dependency ratio declined from 65 percent to a low of 53 percent as baby boomers grew up and joined the global workforce. But from 2010 to 2050, that trend will reverse and the dependency ratio will quickly start increasing. In other words, the world is at an inflection point. The global dependency ratio is still relatively low (which is good for prosperity), but it will rapidly increase as the average age of the population rises (which presents a challenge). Governments will have to devise new ways to support those who are retired and to stimulate wealth creation through innovation and productivity gains, which do not depend heavily on labor.

Of course, each country moves through this curve

Exhibit 2: **The Dependency Curve**

Every country goes through a cycle in which its dependency ratio — the proportion of the population that does not work — rises, and falls, and rises again. While it lasts, the fall in the curve provides a potential demographic dividend: an opportunity for accelerated economic growth. The location of each of the five countries along this generic curve shows how far that country has progressed in its own journey.



Source: David E. Bloom and David Canning, "Booms, Busts, and Echoes," *Finance and Development*, vol. 43, no. 3 (September 2006); U.N. Population Division, "World Population Prospects: The 2008 Revision" and "World Population Prospects: The 2010 Revision"; Booz & Company

at its own pace. China's dependency ratio is expected to begin climbing in 2015, Brazil's in 2025, and India's in 2040. Japan, by contrast, saw its dependency ratio turn upward in 1995. Some countries, including Sweden, Germany, France, Spain, and the U.K., are hoping to prolong their time of lower dependency by keeping more people in the workforce — for instance, by increasing the retirement age past 60, or 65, or 70, or by using policy change to encourage immigration. However, recent protests against raising the retirement age throughout western Europe make it clear that this will not be easy, and unrest in the region has illustrated the demographic difficulties of integrating immigrants into a national culture.

The Arc of Growth

The dynamics of human development — overall quality of life and economic well-being — also take place along fairly universal patterns. By tracking aging against human development, it is possible to see the journey that countries take as they strive to create prosperity and equality. (At this time, no perfect measure of human development exists; we use prosperity and equality as a proxy, but expect this metric to evolve — for instance, by taking into account education levels and environmental sustainability.) This arc of growth also shows a country's position relative to other countries and, by inference, the societal, economic, and environmental issues it faces. (See Exhibit 3.)

There are almost 200 nations in the world. They fall into four clusters on the arc of growth, according to our analysis of 131 sample countries.

1. Nascent countries, in which the dependent population is dominated by people below the age of 15. These countries are also characterized by marginal increases in prosperity and equality levels (rapid increases from a very low base).

2. Momentum countries, in which the population is dominated by people in the working-age group. These nations have higher levels of prosperity and equality than nascent countries, but the rate of marginal increase has dropped from the nascent stage. Countries at this stage need to save and invest efficiently to gain a high level of economic growth before they age.

3. Partially developed countries, in which the dependent population is dominated by people above age 65. These countries have moderately high levels of economic development, but minimal increases in prosperity and equality.

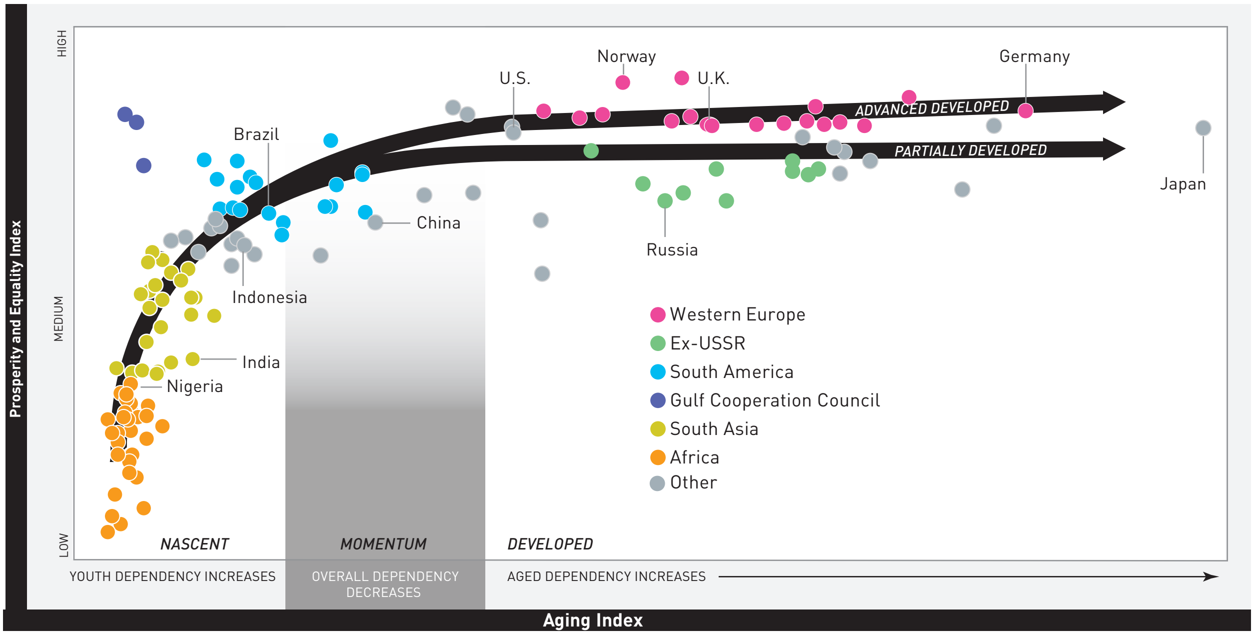
4. Advanced developed countries, in which the dependent population is dominated by people over 65. These countries are characterized by very high levels of economic development and minimal increases in prosperity and equality.

These trajectories are not set in stone, which makes the active use of demographic analysis a powerful policy tool. Governments dissatisfied with their current arc of growth can make policy decisions — such as the decision to improve the quality of the education system, increase workforce productivity, raise the retirement age, or better integrate immigrants into society — that propel their countries to higher arcs of growth.

At each stage, a country's development agenda should build on the progress made in previous stages. For example, in the nascent stage, most countries should focus their employment and labor market strategies on creating job opportunities. As a country progresses into

Exhibit 3: **Countries Along the Arc of Growth**

Countries move along the arc to the right as their populations age, and have the potential to move up as their economies mature. They will follow either the "advanced developed" or the (less prosperous) "partially developed" path, depending on whether they have the necessary measures, such as support for education and productivity, in place.



Source: U.N. Population Division, "World Population Prospects: The 2008 Revision" and "World Population Prospects: The 2010 Revision"; UNDP, Human Development Report 2009; Booz & Company

the momentum stage, it will need to develop a talent base to ensure that these jobs are filled. Once it reaches the partially developed stage, its focus should be on maximizing the productivity of these workers. Finally, in the advanced developed stage, the country needs to ensure that it is capitalizing on productivity gains from game-changing innovation and R&D.

Companies, too, must take demographics into account as they plot their corporate strategies. They will have to adjust their products and services for countries at varying points on the arc of growth. Changing demographic profiles make for new consumer priorities. As countries move along the arc from nascent to momentum, for instance, households begin to spend money on such previously unaffordable goods and services as furnishings, transportation, and communication. Such spending rises for a time as a percentage of consumer spending, and then levels off. After that, a greater percentage of spending shifts to housing and electric power, as well as luxuries (such as recreation and culture, restaurant meals, and hotel rooms). This spending increases continuously as countries move along the arc from nascent to advanced developed.

As employers, companies must also make policy adjustments to accommodate changing market dynamics and needs by developing a more diverse workforce. In a company's initial stages, this may be as simple as outsourcing some basic activities to nascent and momentum countries to capitalize on their large labor pools. Over time, companies can make nascent and momentum countries true anchors in their corporate strategies — for example, creating R&D hubs that tap the insights of regional workers to develop customized products and services for those markets. Companies can take a similar approach in the developed economies by revisiting the structure of career paths to keep older workers on the payroll; doing so will have the dual benefit of keeping the knowledge and experience of these employees in the service of the company and increasing the company's odds of success in tailoring products and services for older consumers in the "gray economy."

Nascent Countries

Most nascent countries are in Africa and Southeast Asia, and are characterized by the United Nations as less developed. Of our 131 sample countries, 55 fall into this group. The full group of all nascent countries totals 2.5 billion people, or 39 percent of the global population. Most have experienced exponential population growth over the past century but low levels of development.

Today, these countries have a large working-age population. By and large, they are youthful countries with relatively high fertility, so youth dependency is high but the number of dependent aging people is low. Generally, Southeast Asian countries have reaped more prosperity gains from their workers than African nations, thanks to better education systems and the reform of their business environment to encourage private enterprise. Most African nations are still struggling to put their youth to work and capitalize on their demographic dividend.

The arc of growth analysis predicts that by 2020, several nascent countries will be transitioning into momentum countries. These fast-paced countries are struggling to provide the infrastructure and services needed to support increased urbanization, offer opportunities for a rapidly growing working-age population, and prevent the emigration of their talent.

India is a prime example of a nascent country on its way up. Thanks to its huge working-age population, it is in the midst of a transition to high economic growth and a potentially high demographic dividend. But managing that growth poses important policy challenges. By 2050, India will have more than 1 billion working-age people. If the government sets a target unemployment rate of 5 percent and counts on a 67 percent labor participation rate, that means the country needs to create about 7 million jobs per year. To pull that off, the government would probably have to boost economic competitiveness by supporting key sectors and promoting increased labor productivity through innovation. Failure to accomplish this would pose major risks; if the unemployment rate in India rose to 15 percent, 110 million people would be unemployed.

That is why India's development level is not optimal at this stage of the game. The answer for India, and for all other nascent countries, lies first in creating the education systems that young people need — improving the quality of basic education and providing better access to college and university training, so skilled graduates are available to replenish the workforce as the aging population retires. Nascent countries also need to invest in providing basic healthcare and access to family planning programs. Although family planning will lower the birthrate, propelling the country more quickly into aging, it will also allow families to invest more in each child, which boosts productivity and prosperity.

Economic policies should support balanced regional development, controlled internal migration, and a sound physical infrastructure for urban development — namely, roads, utilities, and telecommunications. Environmental policies should guarantee food security and water access. Finally, the government of a nascent country should start now to build the financial resources that it will need 30 years from now to meet the liabilities of an enormous aging population. This means not simply creating wealth but putting in place the mechanisms that will sustain it — including robust insurance and banking industries, as well as public and private pension plans that allow people to save for their own future. At the same time, it means avoiding unsustainable policies that will create deficits, such as overly rapid or unnecessary expansion of the military.

Momentum Countries

Of our 131 sample countries, there are 33 countries in the momentum group. The full group of all momentum countries in the world has a total population of 2.6 billion, making up 41 percent of the global population. Most of these countries are in Latin America and East Asia. They have had a recent period of high birthrates

Momentum countries should take a comprehensive look at their assets and capabilities, including natural resources, strategic position, climate, and talent.

and have a young working-age population that is large relative to the dependent population. This generation of workers could propel significant growth if the proper policies are in place.

So far, the East Asian momentum countries have enjoyed stronger economic growth than their Latin American counterparts. They've accomplished this success through a combination of regulatory and judicial reform that has created transparency, stamped out corruption, and generally improved the business environment, encouraging investment.

By 2030 several momentum countries, such as China and some Latin American countries, will start bridging the gap to partially developed or advanced developed status. To prepare for this transition, they must answer important questions: How can governments ensure that policies are in place to create an environment that spurs economic growth and exploits their demographic dividend? What role does the private sector play in the demographic dividend equation? How can Latin American countries emulate the success of their East Asian counterparts?

In momentum countries, social policies should focus on education, particularly higher education, and the development of skilled talent to fulfill labor market needs. Also, as these countries generate greater wealth, it is important for income distribution to be equitable to ensure social well-being and cohesion. As for environmental policies, these countries should work to reduce pollution (including CO_2 emissions) and promote conservation of natural resources.

Economic policies should promote labor productivity by, for instance, encouraging mobility, spurring competitiveness, supporting emerging high-value sectors, and encouraging the private sector to satisfy local consumption. Although such measures are valuable for countries at any stage of development, they are critical for momentum countries. These countries are at a juncture where they may or may not make the leap to become true global players. Momentum countries should take a comprehensive look at their assets and capabilities, including natural resources (such as oil, natural gas, and water), strategic position (for example, the ability to become a transportation and logistics hub between trade regions), climate (which could create vibrant sectors in agriculture or tourism), and talent. This assessment will help momentum countries understand how their particular capabilities will allow them to make a unique contribution to the global economy.

China is the most prominent example of a momentum country. Its dependency curve has hit a historic low, and its development rate is at a historic high. In 2010, China's economy became the second-largest in the world (passing Japan's and becoming second only to the U.S. economy), and some estimate it will surpass the United States in the coming decades. This rapid development has been due in part to a large generation of young, economically active people. But troubles loom. In the medium term, China will begin to feel the constraints of an aging population and low fertility — thanks in part to the one-child policy that has been in place for the last 30 years, which cut sharply into its pool of prospective workers. In the long term, the workforce will age rapidly.

If not managed correctly, this combination of low fertility and rapid aging could keep the country from achieving high development levels. The best response is the one that China appears to be making: to implement

Low fertility rates and slowing population growth in the advanced developed countries could threaten their continued levels of prosperity.

policies that encourage technology and innovation in order to boost productivity and competitiveness. This means upgrading production quality to sustain high export levels and encouraging local consumption fueled by the aging consumer, creating a robust domestic market that will help to support Chinese industries. The government is also improving access to higher education so workers will have the tools to perform high-value work. Next, it will need to carefully develop its social services to prepare for its large and aging population. Other policy considerations include ensuring balanced regional development across China to avoid urban-versus-rural tensions and ethnic divides, and reducing the negative environmental impact of economic growth. The country is already the number one emitter of CO_2 in the world, and its cities suffer high levels of smog.

All these issues are, naturally, on the Chinese government's radar already — and from a purely economic point of view, the government is doing a lot right. For instance, when global demand for its exports shifted during the 2008 economic downturn, China shifted its economic policies to spur greater domestic demand. It will need to be cautious, however, and avoid the mistakes of the U.S. in creating a highly leveraged economy; that vulnerability would be even more damaging if played out in a country the size of China.

A lack of social cohesion, too, could undermine progress if this issue is not carefully managed. The country's remarkable creation of wealth has thus far been distributed very unevenly. As countries across the Arab world were vividly reminded in 2010, a large cohort of young people who feel excluded from economic opportunities is the most significant ingredient in a recipe for unrest.

Partially Developed Countries

The partially developed category is by far the smallest. Within our 131 sample countries, this group consists of 19 countries. The full group of all partially developed countries has about 320 million inhabitants, or 5 percent of the world's population. Russia accounts for nearly half of this population; the other countries in this group are all in eastern Europe, including the former nations of the Soviet Union, as well as nearby neighbors such as Poland, Hungary, and the Czech Republic. These countries had a post–World War II baby boom, but their state-driven economies prevented this large labor force from translating into robust economic growth. Although these nations achieved a certain level of development, they did not fully exploit their demographic dividend.

Today these countries face rapidly declining fertility rates and rising mortality rates, particularly since the collapse of the Soviet Union. Their economies are threatened not just by a growth slowdown, but also by a decline in population. Some governments have tried various programs to encourage more births, including housing benefits, stipends, and lengthy paid maternity and paternity leaves. Unfortunately, these have not boosted birthrates significantly and have weighed heavily on government finances.

The arc of growth analysis predicts that by 2040 many of these partially developed countries will, at best, remain at current levels of economic growth. They will feel less prosperous than most nascent and momentum countries. Although these projections are not certain, the partially developed nations must address some very thorny problems if they are to escape this fate. Are their governments doing enough to prepare for their respective demographic challenges? Is the healthcare sector positioning itself to ensure delivery of effective medical care to an aging population?

On the social policy front, these countries must transform legacy education, healthcare, and social security systems. Governments should consider immigration policies to bolster the workforce; such policies would need to include strategies to integrate immigrants into society without threatening national identities. On the economic front, governments need a growing revenue base. To generate this, business environments need to be improved — via the streamlining of rules and regulations and increased transparency — to attract domestic and foreign investment. And policies should encourage research, development, and innovation to boost productivity and competitiveness.

Russia is the most visible example of a partially developed nation facing these challenges. The bulk of its baby boom population is hitting retirement age — 55 for women and 60 for men — and fertility has been well below replacement levels for years. This will put pressure on government finances by driving up pension costs as the ratio of pension contributors to pension recipients decreases. In 2010, six workers supported each retiree. By 2050, just two workers will support each retiree. Moreover, the legacy Soviet-era culture and the promises made by Russia's leaders to its aging population since the fall of the Soviet Union have given many people a sense of entitlement that will be difficult to overcome. This unfortunate confluence of factors could significantly impair Russia's ability to grow its economy.

Russia must take action quickly. Before the breakup of the Soviet Union, Russia was a leader in science and math. That is no longer the case, and to compete again on the world stage it must overhaul its education system. The Russian social security and healthcare systems are also inadequate for the country's aging population. On the economic front, policies should encourage innovation, productivity, and the competitiveness of local industries, and diversify away from Russia's reliance on resource industries such as energy, forests, fishing, and mining. Russia should look to the example of other countries in the partially developed category, which are not fortunate enough to sit on large pools of oil and gas and thus must diversify their industries and find new ways to compete in the global knowledge economy.

Advanced Developed Countries

The advanced developed category consists of developed and affluent countries. Of our 131 sample countries, 24 are in this category, dispersed throughout Europe, North America, and the Asia/Pacific region. The full group of all advanced developed countries has a total population of 952 million, representing 15 percent of the world's population. Most of these countries saw their working-age populations grow from the late 19th to early 20th centuries, and then surge in the mid-20th century as the baby boomers entered the workforce. But by the 1960s, fertility rates in most of these nations started dropping quickly, and today, low fertility rates and slowing population growth could threaten their continued levels of prosperity. The notable exception is the United States, which, thanks to its immigration policies and relatively higher fertility rates, will continue to grow.

By 2050, these countries' populations may continue to age and see prosperity gains dwindle. Like the partially developed countries, these countries could feel relatively less prosperous as many nascent and momentum countries make economic gains. Policymakers must wrestle with the reality of an aging society dependent on a smaller working-age population. How can governments provide the support needed by an increasingly age-dependent population? How should the private sector react to changing consumer demographics?

The advanced developed category covers a wide spectrum of average population age — from the United States, which is still on the young side with a relatively open immigration policy and a growing workforce, to Japan, which has few immigrants, a shrinking workforce, and the most elderly population in the world. Japan must increase productivity by 2 percent per year to maintain its historical GDP per capita growth — which is no small task. That is double the current productivity gain in the United States.

First and foremost, these countries must redefine the notion of aging. Some governments have begun by attempting to raise the retirement age, but that measure is just a starting point. The real challenge is cultural. Countries need to raise a new generation that considers work to be a lifelong endeavor, with periods of varying intensity, rather than an activity that they perform for a preset number of years and then stop altogether at retirement. Developing this concept of work will involve the public and private sectors as well as civil society and academia. It must be introduced as early as preadolescence — embedded in the education system, and reinforced by flexible career paths that allow employees to gradually ramp down in their 60s and 70s instead of retiring.

Making the shift will be challenging, but this approach to work is increasingly plausible in knowledge-based economies, where employees can remain productive despite their advancing years — as opposed to manufacturing economies that require large amounts of physical labor. Pension plans and other social safety nets will need to be reformed accordingly, allowing for the gradual introduction of benefits as employees begin working less. In addition, governments can bolster their workforce through immigration reform and gender equality initiatives that will draw more women into the workforce. On the economic front, productivity gains through innovation will be vital.

For example, Japan must further increase its investment in R&D. It must provide incentives to boost private-sector capital investment, and find ways to integrate more women and older workers into the workforce. Beyond that, Japan will need to consider some important means of boosting its economy that it has ignored in the past. For example, by tightly restricting immigration, Japan avoids some challenges — such as questions of national identity that are raised as immigrants become a large segment of the population — but gives up the major gains in economic output that immigration can bring.

Demographically, the U.S. is in better shape than Japan, although it is not without its own challenges. The U.S. dependency curve is at a historic low and its human development at a historic high. The question, however, is whether it can maintain its position in this demographic sweet spot. Although fertility rates in the U.S. are far lower than they were 50 years ago, they are higher than those of other advanced developed nations; this, coupled with the country's relatively open immigration policy, will keep its population growing. But this growth brings with it the well-known integration challenges associated with the new arrivals, and an ongoing political debate about how open the borders should remain. Moreover, even with immigrants flowing in, the U.S. will still get grayer; the age-dependent population will climb from 13 percent in 2010–11 to 22 percent by 2050.

The U.S. must look beyond the short-term economic fixes of its recent past, such as increased dependence on consumption, and focus on pro-growth policies that increase productivity through innovation and R&D, encouraging private-sector efforts. It should also join Europe and Japan in rethinking the prevailing assumptions about aging and work. On the environmental front, policies should steer energy consumption into alternative and renewable energy sources and promote awareness of the benefits of sustainability.

Shaping the Future

Government and business leaders need to set out now to improve the conditions that will exist at the other end of their trajectory. Countries that are pleased with their current circumstances will need to put in place the policies that will preserve their good fortune, even as their demographic profiles change. Countries that wish to improve their lot will have to work even harder to formulate the right policies. They must ensure, beginning in the nascent stage and moving up to the advanced developed phase, that public infrastructure keeps up with demand; that education is high-quality and accessible; that immigrants and women are integrated into the workforce; and that social security and healthcare systems are transformed so that large aging populations do not overwhelm the workforce and stifle the economy. In essence, they must make sure that whatever their position on the arc of growth, their demographic circumstances are a source of power and wealth rather than a drag on the economy.

Business leaders, meanwhile, must respond to aging populations by seizing opportunities and confining risks. They must cope with changing preferences as consumers age; they must go abroad to develop new markets, targeting countries that are moving most rapidly through the arc of growth; and they must adjust to changing workforce patterns and shifting supply chains. Most of all, they must look beyond their immediate goals and consider how demographics are affecting their industry as a whole.

These challenges are daunting and inspiring at the same time. Through the lens of proactive demographics, both governments and companies can glimpse the future and influence its outcome. +

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