Chapter Three

CASE STUDIES OF POPULATION CHANGE AND ECONOMIC GROWTH

This chapter examines the interplay between population change and economic growth within specific regions of the world: East Asia; Japan; North America, Western Europe, Australia, and New Zealand; South Central and Southeast Asia; Latin America; the Middle East and North Africa; sub-Saharan Africa; and Eastern Europe and the former Soviet Union. The East Asian nations have experienced the most success in exploiting the "demographic dividend" made available by reduced fertility. Latin America has undergone a less dramatic transition and has had far less success in creating conditions for economic growth. The Middle East and North Africa are still in much earlier stages of the demographic transition, and indeed many parts of sub-Saharan Africa have seen virtually no decreases in traditionally high fertility rates. Japan, a developed country with an aging population, illustrates the "back end" of the demographic transition: It is facing the issues posed by a declining workforce and an increasing ratio of elderly dependents. Eastern Europe and the former Soviet Union also have aging populations and very low birth rates that will present challenges.

EAST ASIA

The East Asian "economic miracle" offers some of recent history's most compelling evidence of the "demographic dividend."[1] The East Asian demographic transition occurred with relative rapidity, over a 50–75-year period—the fastest demographic transition to date.[2] Modern transitions are faster because countries gain the benefit of knowledge, experience, or technology developed by others.[3]

Throughout the world, dramatic improvements in public health emerged from the late 1940s onward, largely through improved sanitation, safer water, and the development of broad-spectrum antibiotics and antimicrobials (for example, penicillin, sulfa drugs, streptomycin, bacitracin, chloroquine, and tetracycline, discovered and introduced between 1920 and 1940, and the use of DDT from 1943). From the 1950s onward, there were significant and sustained declines in infant and child mortality. The infant mortality rate (the proportion of babies who die before their first birthday) in East Asia dropped from 181 per 1,000 in 1950 to 34 per 1,000 in 2000 (United Nations, 2001). In time, the effect of the decrease in mortality carried through to a fall in fertility rates. This was assisted by family planning programs, which made contraceptives both easier to obtain and more socially acceptable. In the 1950s, East Asia's developing countries used voluntary programs of incentives to encourage families to have fewer children, and the transition from high to replacement-level fertility took less than 30 years (Mason, 2001). In 1950, the typical East Asian woman had 6 children; today she has 2. In the lag between the decrease in infant mortality and the decline in fertility, a baby-boom generation was created.[4]

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[1] See Mason (2001) for a detailed and compelling set of analyses on similar topics that reach similar conclusions. Among other topics, Mason addresses the possibility of reverse causality, i.e., from economic growth to demographic change.

[2] In Western Europe, for example, the process began in the mid-18th century and was to last nearly 150 years. In Sweden, the transition took even longer, occupying the better part of 300 years; see also Bloom, Nandakumar, and Bhawalkar (2001).

[3] In Ireland, for example, since modern contraception was legalized—first among married couples, and then generally—there has been a steep decline in fertility since the early 1980s.

[4] The working-age population rose from around 57 percent of East Asia's total population in 1965 to around 68 percent in 2000.

The East Asian demographic transition was one of the critical factors in the region's spectacular economic growth (Bloom and Williamson, 1998; Bloom, Canning, and Malaney, 2000). Between 1965 and 1990, per capita income rose annually by more than 6 percent. One explanation for this phenomenal growth is that in the late 1960s, when the baby-boom generation started work, their entry into the workforce changed the ratio of workers to dependents in the population. With the benefits of a good education and a liberalized trade environment, this generation was absorbed into the job market and into gainful employment, thereby increasing the region's capacity for economic production. The region's working-age population grew nearly four times faster (an average of 2.4 percent a year) than its dependent population between 1965 and 1990. A virtuous spiral was thus created, whereby population change increased income growth, and income growth pushed down population growth—and therefore the number of dependents—by reducing fertility.[5] East Asia's high savings rates were also affected by the demographic transition, as the baby-boom generation entered the workforce and parents had fewer children to take care of, although the extent of the effect is disputed in the literature.[6] Results from Bloom and Sachs (1998), Bloom and Williamson (1998), and Bloom, Canning, and Malaney (2000) suggest that the demographic dividend accounts for between one-fourth and two-fifths of East Asia's "economic miracle." Growth accounting exercises presented by Mason (2001) further confirms the results of the regression analyses in these works.

Yet as its baby-boom cohort ages, East Asia must prepare for an aging population. Not only did infant mortality decrease, but mortality at other ages fell as well and, as a result, life expectancy has risen from around 43 years in 1950 to 72 years today. Population growth has slowed dramatically—from a peak of 2.4 percent a year in the late 1960s, it is now 0.66 percent a year, and predicted to be only 0.2 percent by 2025. When the baby boom retires, the ratio of dependents to workers will change again, and bring added challenges to policy-

[5]For discussion of how the spheres of globalization, liberalization, and sustainable human development can be managed to help capture the demographic dividend, see Bloom, Mahal, King, et al. (2001).

[6]See Mason (2001) for a discussion of the literature on savings rates and the demographic transition.

makers and the economy (see detailed discussion of Japan below). Pensions and health care for the elderly will come under strain, and economic growth is likely to slow down as the labor force declines.

An aging population is, fundamentally, a mark of development success. However, the aged face a range of potential problems, including poverty (Japan has elderly poverty rates above 18 percent; see Gruber and Wise, 2001). Additionally, the speed of change in the modern world—including profound changes in family and social patterns—means that policymakers worldwide will be hard-pressed to ensure that the challenge of an aging society does not become a crisis.[7] They will also need to address the fact that a significant proportion of the elderly are women, who often suffer a double disempowerment based on age and gender.

East Asia, with its mix of advanced and developing economies, can expect a variable set of challenges to emerge in the next decade or so. The challenge is already present in some of the richest countries in the region, like Korea and Hong Kong. In the medium term, over the next decade or so, the problem of aging populations will also become more pressing in less wealthy countries such as China (see Randel, German, and Ewing, 1999).

JAPAN

Japan is perhaps the world's most rapidly aging country, with life expectancy the highest in the world. A Japanese person born today can expect to live until 81. Whereas in 1920 the median age of the population in Japan was only 27 years, today it stands at over 40 years. Fertility rates are low in Japan—at 1.3 children per woman. The consequences of Japan's rapidly aging population are already being felt, as policymakers strive to prepare for the challenge of an increasingly elderly population. Today, around four people of working age support each pensioner, but in 2025 falling birth rates are expected to halve that figure. In 1950, the ratio was 12 workers for each pensioner (United Nations, 2001).

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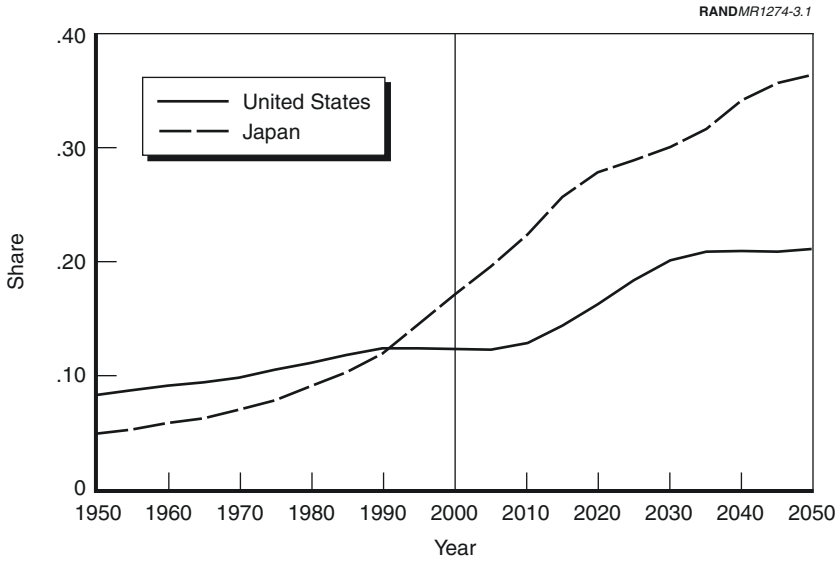
[7]With more women working and a decrease in co-residence of elderly parents with their adult children, the Japanese tradition of family members looking after their elderly is waning. See Bloom, Nandakumar, and Bhawalkar (2001).

Japan is approaching the end of its demographic transition, having enjoyed the economic successes of its demographic dividend, combined with strong policies. After World War II, Japan was in economic crisis. The war had destroyed nearly half of the nation's industrial plants and infrastructure. However, with a series of policies concentrating on building modern factories, and a well-educated and highly literate workforce, Japan was able to push its economy to the forefront of technology and modernity, establishing itself as one of the world's most powerful economies.

Government/industry cooperation, a well-educated and motivated workforce, a focus on technology, and a comparatively small defense allocation (1 percent of its gross domestic product [GDP]) contributed to Japan's economic success.

But now 17 percent of Japan's population is 65 years old or over (see Figure 3.1). In 2050, 36 percent of the population will be aged 65+, with 15 percent aged 80+; the dependency ratio will rise from 0.47 to 0.96 (United Nations, 2001). Their care needs (medical, social, and financial) represent a significant challenge. Forty percent of the 65+ population in Japan live either alone or as a couple. With the breakdown of extended families, the elderly cannot depend on their families to provide for them, and the state must prepare to step into the gap.

Pensions are a particular challenge, given that many countries finance pension payments from current taxation. With a smaller, young workforce supporting a pay-as-you-go pension system, spending on pensions could push Japan's budget deficit up to 20 percent of its GDP by 2030. Pension contributions will have to increase to 35 percent of salaries to maintain the current level of payouts.



SOURCE: United Nations, "World Population Prospects: The 2000 Revision," CD-ROM, 2001.
NOTE: Post-2000 data are UN projections.

Figure 3.1—Population Share Aged 65+

Finally, with the drop in fertility rates and with many people retiring, the number of people working will become smaller, further challenging Japan's economy and slowing growth.[8] But Japan will not be alone in facing such challenges in the coming decades. Several of the available reforms proposed by, among others, the Organization for Economic Cooperation and Development,[9] including labor and product reforms and fiscal consolidation, represent good governance strategies irrespective of the aging issue. Nevertheless, the growing proportion of the elderly will no doubt present significant challenges to policymakers.

[8]It is estimated that Japan's labor force will fall by 13 percent between now and 2050, and that income growth will slow to 0.25 percent per year by 2040 (Turner et al., 1998).

[9]For an accessible overview see, for example, Vanston (1998).

NORTH AMERICA, WESTERN EUROPE, AUSTRALIA, AND NEW ZEALAND

The developed world has reached an advanced stage of the demographic transition. Fertility rates are below replacement level in many countries in Europe, and populations are growing at a slow pace. North America continues to grow largely because of its high rates of net in-migration and large population of childbearing age, while Western Europe's population has plateaued and will begin a slight decline in a few decades. From 2001 to 2025, the population of Europe as a whole is expected to decline by 6 percent, and that of Japan by 3 percent; North America's is expected to grow by 21 percent. Sub-Saharan Africa, on the other hand, is projected to grow by 74 percent (United Nations, 2001).

The demographic transition in the developed world began in the 19th century. Over a 100-year period (from 1861 to 1961), infant mortality in England and Wales declined from 154 deaths per 1,000 live births to 21 per 1,000. Life expectancy at birth (again, in England and Wales) also rose over that same period, with male life expectancy rising from 40 to 68. Fertility also fell, in most countries by about 50 percent between 1870 and 1940 (Teitelbaum and Winter, 1985). During the late 19th and early 20th centuries, the working-age population began to grow more quickly than the young dependent population, potentially contributing to the acceleration of economic development that occurred in the West in this period (Malmberg and Lindh, 2000). After World War II, however, increased optimism about the future saw fertility rates in the West shoot up. From a low of 2.2 children per woman in the 1930s, U.S. fertility rates rose to a high of 3.8 in 1957. The pattern in the United Kingdom, Australia, Canada, and New Zealand was similarly dramatic (Teitelbaum and Winter, 1985). Fertility rates only began to fall again in 1960, declining sharply and reaching replacement levels in the mid-1970s. Other Western European countries also experienced fertility increases after World War II, although on a smaller scale. The famous baby-boom generation was thus created. Some research finds that these post–World War II demographic changes had a significant effect on economic growth. As noted earlier, population growth among middle-aged adults can promote income growth, and population growth among the elderly tends to slow growth. Population growth among

young adults, on the other hand, seems to have no effect (Lindh and Malmberg, 1999; Malmberg, 1994).

Caplow, Hicks, and Wattenberg (2001) note that fertility in the wealthy industrial countries has continued to fall, and is likely to remain below the replacement level of 2.1 births per woman well into the 21st century. The baby-boom generation is now approaching retirement age, and the continued decline in fertility rates has meant that the West now faces the problem of an aging society, where an increased cohort of elderly relies on a reduced working-age population. The UN Population Division has forecast that the percentage of people aged 60 or over in the developed regions will rise from 19 percent in 2000 to 33 percent by 2050 (United Nations, 2001). Furthermore, the dependency balance has shifted. In 1950, children made up 27 percent of the population in these regions, and people aged 60+ made up 12 percent. By 2050, however, this situation will be reversed, with the proportion of older people rising to 33 percent and that of children falling to 16 percent.

Population aging is most advanced in Europe and Japan. The median age of Europeans is expected to rise from 38 in 2000 to 49 in 2050, and the median age in Japan is already 41 (United Nations, 2001). So, whereas South Central Asia and sub-Saharan Africa's policymakers should be looking at ways to capture a future demographic dividend, the governments of the developed world, whose dividend is about to expire, are likely to find coping with an aging population high on their list of priorities. Aging populations will put pressure on social security systems, health services, and pensions, as the smaller working-age group contributes fewer taxes and the economy, potentially, shrinks.

The United States' welcoming of immigrants, which will ensure that the working-age population continues to grow, is in marked contrast to Japan's policy, where immigrants make up just 1.2 percent of the population. Notwithstanding the fact that Western Europe is more open than Japan, its population is still likely to shrink slightly and age over the next 50 years.

In many wealthy industrial countries, public-sector reform will focus on health care, pensions, and social security. Private health care and pensions are likely to become more important, along with public–

private partnerships in health care provision (Fuchs, 1999; Bloom, Craig, and Mitchell, 2000; Reich, 2000). Raising the retirement age and encouraging people to work at older ages via tax breaks and lifelong training have also been suggested (Wattenberg, 1987; Bloom, Nandakumar, and Bhawalkar, 2002).

Some have even predicted great difficulties for the West as a result of the aging boom (Peterson, 2000), but changing habits—whereby people turn to private health care and pensions, retire later, and do more work for longer—are likely to soften the blow.[10] Changing immigration patterns may also play a part in averting economic difficulties.[11] The private sector is likely to have a vital role to play both in provision of public services and attracting immigration. Engaging private enterprise will require a change in attitudes, particularly in those Western European countries used to overbearing public-sector bureaucracies, so change is likely to be slow. Policymakers will have to focus on facilitating these changes, and prompt action now will ease the pain later.

SOUTH CENTRAL AND SOUTHEAST ASIA[12]

South and Southeast Asia have lagged behind East Asia in the demographic transition. However, Southeast Asia has recently begun to benefit from the demographic dividend, and South Central Asia is likely to follow (Asian Development Bank, 1997, p. 142).

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[10]On the other hand, Weil (1999) argues that trying to forestall this process by encouraging fertility may entail its own large transitory costs.

[11]See Section 2.3 of Weil (1997) on the effects that immigration can have on slowing growth in the dependency ratio.

[12]It is often difficult to compare results across studies because the geographical definitions of different regions vary from one source to another. For example, many of the demographic statistics cited here are based on UN data and regional groupings, whereas some of the economic analysis is based on a somewhat different set of regional groupings used by the Asian Development Bank. The demographic data presented here reflect the following UN definitions: South Central Asia consists of Afghanistan, Bangladesh, Bhutan, India, Iran, Kazakhstan, Kyrgyzstan, Maldives, Nepal, Pakistan, Sri Lanka, Tajikistan, Turkmenistan, and Uzbekistan. Southeast Asia consists of Brunei Darussalam, Cambodia, East Timor, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam.

Until 1950, population growth rates across Asia as a whole had remained relatively stable at less than 1 percent per year for at least the previous 70 years. However, from 1950 to 1990, rates in South Central and Southeast Asia shot up, averaging well over 2 percent per year. These rates were lower than in Africa, but similar to those in Latin America and well above those in East Asia, North America, and Europe. This growth can firstly be attributed to falling mortality rates. The introduction of drugs to treat diseases such as tuberculosis, scarlet fever, and pneumonia, coupled with the use of DDT to combat malaria, saw infant mortality rates in particular decline dramatically. As in East Asia, fertility declines followed the fall in mortality. Health improvements have meant that families have needed fewer children in order to ensure achieving their desired family sizes. Family planning programs have also had an impact (Asian Development Bank, 1997). The fall in Southeast Asia's fertility rate has been nearly as dramatic as that of East Asia, while South Central Asia's average number of births per woman has been nearly halved since 1960. Southeast Asia's rate is expected to come close to East Asia's rate by 2020. This will eventually lead to a decline in population growth rates to around 1 percent per year by approximately 2020 (Asian Development Bank, 1997, p. 150; United Nations, 2001).

In addition to the size of the region's population, its age structure has also changed. As shown in Table 3.1, although South Central and Southeast Asia's economically active populations grew in comparison with their economically dependent populations from 1965 to 1990, the difference was much less marked than that in East Asia. (Table 3.1 also gives the analogous figures for all regions of the world through 2015.) As a consequence, the demographic dividend has so far been less pronounced in these regions. While East Asia's working-age population made up 67 percent of the region's total population in 1990, Southeast and South Central Asia's was less than 60 percent. Moreover, the percentage in East Asia rose sharply in the 15 years after 1975 (from 57 percent to 67 percent), while in the rest of Asia it rose more slowly (from 56 percent to 58 percent in South Central Asia; from 54 percent to 59 percent in Southeast Asia; and from 54 to 57 percent in Southwest Asia). By 2025, Southeast Asia (at 68 percent) will match, and South Central Asia (at 67 percent) will nearly match, the figure for East Asia (68 percent). Consistent with this, dependency ratios have fallen more slowly in Southeast and South Central

Asia, with the latter's youth dependency ratios (the percentage of those under 15 years old relative to the working-age population) experiencing only modest declines. Between 1975 and 1990, the youth dependency ratio fell from 0.77 to 0.62 in Southeast Asia and from 0.73 to 0.65 in South Central Asia; the comparable figures for East Asia are 0.66 and 0.40.

While Southeast Asia has already gained considerable economic benefit from its demographic change (which accounts for about 1 percentage point of per capita annual income growth [Bloom and Williamson, 1998; Bloom, Canning, and Malaney, 2000]) and is likely to see this benefit reduced over the next 25 years as the population ages, South Central Asia's transition is still continuing, suggesting growing potential for economic growth. More specifically, the current demographic dividend of approximately 0.7 percentage points of per capita annual income growth could well double as the boom reaches its peak (Asian Development Bank, 1997, pp. 158–159).

To fully capitalize on the demographic dividend, however, South Central Asia would do well to follow the policy initiatives employed so successfully by East Asia. Fertility in the region is still high—at around 3.2 births per woman in 2000 (the rates in Southeast Asia and East Asia are 2.5 and 1.8, respectively [United Nations, 2001]). Family planning programs will help to push fertility rates down, and will have the corollary effect of limiting the spread of HIV/AIDS. As the Asian Development Bank (1997) and many others have shown, there is a large unmet demand for contraception across South and Southeast Asia, and eliminating all unwanted births would go a long way toward reducing fertility to replacement levels.

Education and training are other key areas that determine the success of a country's efforts to capture a demographic dividend. Although primary and secondary enrollment levels in Asia have risen dramatically in recent decades, the demand for quality tertiary education from employers and secondary school graduates and their families is as yet largely unmet. The emerging global economy places increasing emphasis on higher education. Many countries in the region may not be able to take full advantage of their favorable demographic indicators because of relatively low rates of tertiary enrollment. New approaches to funding and a new focus on high-value

Table 3.1

Annual Growth Rates of Total Population, Working-Age Population, and Non–Working-Age Population for Asia and Its Subregions (percent)

	1965–1990			1990–2015			2015–2040		
	Total	WA	NWA	Total	WA	NWA	Total	WA	NWA
WORLD	1.84	2.14	1.39	1.27	1.54	0.81	0.83	0.72	1.03
More-developed regions	0.69	0.90	0.29	0.22	0.24	0.19	-0.04	-0.53	0.82
Less-developed regions	2.23	2.63	1.70	1.52	1.87	0.94	0.98	0.94	1.07
Least-developed countries	2.52	2.50	2.55	2.54	2.78	2.26	2.05	2.47	1.44
Less-developed regions excluding China	2.39	2.63	2.07	1.78	2.20	1.14	1.19	1.30	1.00
Less-developed regions excluding the least-developed countries	2.19	2.65	1.57	1.36	1.75	0.67	0.75	0.63	0.97
Sub-Saharan Africa	2.82	2.74	2.91	2.51	2.73	2.26	1.99	2.55	1.20
AFRICA	2.77	2.77	2.77	2.36	2.67	1.99	1.84	2.28	1.18
Eastern Africa	2.92	2.86	2.98	2.50	2.71	2.26	2.05	2.61	1.30
Middle Africa	2.78	2.48	3.11	3.05	3.06	3.04	2.62	3.27	1.84
Northern Africa	2.57	2.87	2.22	1.76	2.46	0.65	1.02	1.09	0.88
Southern Africa	2.48	2.75	2.14	0.90	1.25	0.35	0.17	0.31	-0.08
Western Africa	2.83	2.70	2.98	2.66	2.97	2.30	1.92	2.57	0.97
ASIA	2.06	2.51	1.44	1.30	1.64	0.69	0.72	0.57	1.02
Eastern Asia	1.75	2.43	0.66	0.74	0.94	0.32	0.18	-0.36	1.24
South Central Asia	2.28	2.49	2.02	1.69	2.17	0.94	1.00	1.11	0.77
Southeast Asia	2.26	2.66	1.74	1.43	2.00	0.43	0.80	0.68	1.04
Western Asia	2.76	3.06	2.39	2.17	2.51	1.65	1.58	1.68	1.42

Table 3.1—continued

	1965–1990			1990–2015			2015–2040		
	Total	WA	NWA	Total	WA	NWA	Total	WA	NWA
EUROPE	0.52	0.69	0.20	-0.10	-0.00	-0.30	-0.39	-0.93	0.59
Eastern Europe	0.61	0.76	0.33	-0.40	-0.09	-1.07	-0.63	-1.10	0.36
Northern Europe	0.34	0.38	0.27	0.16	0.22	0.06	-0.05	-0.57	0.80
Southern Europe	0.60	0.79	0.22	-0.02	-0.06	0.07	-0.48	-1.13	0.60
Western Europe	0.38	0.64	-0.10	0.19	0.08	0.41	-0.16	-0.73	0.75
LATIN AMERICA AND THE CARIBBEAN	2.28	2.74	1.71	1.44	1.91	0.65	0.81	0.71	1.00
Caribbean	1.62	2.06	1.02	1.00	1.31	0.47	0.49	0.34	0.76
Central America	2.67	3.19	2.08	1.67	2.27	0.72	0.89	0.87	0.92
South America	2.23	2.67	1.64	1.41	1.85	0.64	0.81	0.68	1.05
NORTHERN AMERICA	1.01	1.40	0.37	0.93	0.99	0.79	0.65	0.24	1.37
OCEANIA	1.66	1.96	1.17	1.30	1.35	1.20	0.84	0.66	1.14
Australia/New Zealand	1.48	1.82	0.88	1.01	1.02	1.01	0.55	0.16	1.23
Melanesia	2.38	2.57	2.15	2.21	2.57	1.69	1.54	1.87	0.96
Micronesia	2.57	2.98	2.05	2.18	2.21	2.14	1.37	1.79	0.66
Polynesia	1.69	2.36	0.90	1.18	1.55	0.60	0.90	1.02	0.68

SOURCE: United Nations, "World Population Prospects: The 2000 Revision," CD-ROM, 2001.

NOTE: WA = working-age population; NWA = non–working-age population.

areas such as technology and tourism will be required if the region is to catch up with the likes of North America.[13] India, with its burgeoning information technology sector, has already seen, via job creation, remittances, and foreign direct investment (FDI), the benefits of investment in quality higher education and a focus on core new economy subjects: science and technology (Bloom and Rosovsky, 2001).

The new economy will also require a focus on lifelong training. As a country's economy moves toward producing products and services with more value added, workers will need to be retrained to cope with the demands of a flexible labor market. This should be combined with labor market flexibility. If the South Central Asian labor market cannot cope with the huge influx of workers produced by the demographic shift, a potential virtuous spiral (with a bigger labor force contributing to increased productivity and higher savings rates) could be reversed, with rising unemployment levels leading to crime, poverty, and civil disorder.

As in East Asia and the West, policy in South Central and Southeast Asia will also need to look to the long term, when the boom generation retires. Health care systems and pensions will come under pressure, and the private sector may be usefully harnessed to help drive reform efforts.

The importance of policy to the success of attempts to capture the demographic dividend was demonstrated in East Asia. Southeast Asia, whose transition is fairly well advanced, and South Central Asia, whose potential boom is yet to come, cannot assume that demography alone will guarantee economic growth. Many governments in these regions have made a good start in certain key areas—Bangladesh has had great success with family planning programs, for example; India with basic and secondary education and the technology sector; Thailand with health efforts that have limited the spread of AIDS; and many of the countries of Southeast Asia in liberalizing labor markets and attracting foreign investment. However, there is more work to be done, and, with the demographic shift advancing,

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[13]For a fuller discussion of the importance of higher education and approaches to reforming it, see Task Force on Higher Education and Society (2000).

the quicker it is done the better. Fertility levels are still high, tertiary education is weak, and exports are underdeveloped. The potential is there for the rest of Asia to do as well as East Asia. The region's success will depend on its policymakers.

LATIN AMERICA

Latin America's population growth is following a pattern similar to East Asia's. In 1965, life expectancy in Latin America and East Asia was in the upper 50s. Following similar improvements in public health, Latin America's life expectancy now stands at 70 years, slightly behind East Asia's 72. There have also been significant reductions in infant mortality in Latin America, which decreased from 91 deaths per 1,000 live births in 1965 to 32 in 2000 (a figure very similar to East Asia's 34). The fertility rate has also fallen—from around 5 children per woman in 1975 to the present 2.5. In some countries in the region, such as Brazil, Chile, and Uruguay, the fertility rate is just above replacement level. Barbados, Cuba, and Trinidad and Tobago are far below this level. Other countries, however, have much higher rates. In Bolivia, Guatemala, Haiti, Nicaragua, and Paraguay, women are having approximately 4 children (United Nations, 2001). It may be significant that income disparities in the region are also the widest for any region in the world (although sub-Saharan Africa runs a close second).

Although Latin American demographic changes have been favorable for growth since 1970, economic growth has yet to follow the East Asian example. So while East Asia shows a GDP per capita annual growth rate between 1975 and 1995 of 6.8 percent, the growth rate for Latin America over the same period is one-eighth of that, at 0.7 percent. Although there has been much debate surrounding Latin America's failure to thrive, there appears to be a growing consensus that the heart of the matter concerns policy (Inter-American Development Bank, 2000).

The region also experienced considerable changes in economic policies, with a growing adoption of the Washington Consensus in

the late 1980s and 1990s.[14] Between 1965 and 1990, Latin America was largely closed off from the world economy. By 1980, only 12 percent of the region counted as being "open" (as defined in Sachs and Warner, 1995). Cross-country regression analysis suggests that a country with a working-age population growing 3 percent per year, and 1.5 percent faster than its overall population, will see its growth boosted by 0.5 percent a year if its economy is closed, but by 1.5 percent a year if its economy is open (Bloom, Canning, Evans, et al., 1999; Inter-American Development Bank, 2000; Bloom and Canning, 2001a). In other words, a policy of openness can triple the size of the demographic dividend the country collects. A retrospective analysis suggests that had the region been completely open between 1965 and 1985, Latin America's annual growth rate of GDP per capita would have been 0.9 percentage points higher on average. This would have doubled growth for each year, on average, during that period.[15]

A combination of weak governance and a lack of openness to trade appears to have slowed the potential growth that demographic changes might have brought to Latin America. This interaction is important. Analysis shows that the direct effect of changing age structure accounts for only 11 percent, or 0.6 percentage points, of the growth gap between Latin America and the fastest-growing East Asian economies. However, when the interactive effects of policy and demography are also taken into consideration, some 50 percent of the gap is accounted for (Bloom, Canning, Evans, et al., 1999). In

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[14]John Williamson, the inventor of the term *Washington Consensus*, has made it clear that he believes the term has two quite different meanings. First, there is the meaning he gave the term, which involved consensus around a set of ten policy reforms that he believed were widely accepted as beneficial by economists. In the original formulation, these were fiscal discipline; a redirection of public expenditure priorities toward fields offering both high economic returns and the potential to improve income distribution, such as primary health care, primary education, and infrastructure; tax reform (to lower marginal rates and broaden the tax base); interest rate liberalization; a competitive exchange rate; trade liberalization; liberalization of FDI inflows; privatization; deregulation (in the sense of abolishing barriers to entry and exit); and secure property rights. Then there is the meaning the term has acquired: "market fundamentalism or neo-liberalism: laissez-faire, Reaganomics, let's bash the state, the markets will resolve everything." We use the term in the latter, now more common, usage (see Williamson, 1999).

[15]The growth is measured in 1985 purchasing power parity international dollars. See Summers and Heston (1991).

other words, countries in East Asia pursued a range of policies (especially trade policies that created substantial numbers of new jobs) that allowed them to take much fuller advantage of their demographic dividend. Latin America has yet to take such advantage of its population dynamics.

So while the demographic transition produces favorable conditions, it does not guarantee that an increased supply of workers will be gainfully employed. Nor does it ensure that those who wish to save will find themselves encouraged to do so. Neither can it provide institutions to reinforce health advantages or to create the educated population vital to an economy built around high-value-added activities. Latin America began its demographic transition, but was overly reliant on domestic demand and did not export vigorously. Many of its governments were corrupt, and repeated financial disasters had the effect of making saving ill-advised.[16]

There are signs of hope, however. Between 1990 and 1995, approximately 70 percent of the region opened up to the world economy, reflecting substantial policy reform. And it could have been worse, of course. With even more unsuitable policies, the baby boomers could have become a heavy burden, rather than an asset, as the unemployed acted as a drag on the economy and damaged the fabric of society. The opportunity to benefit from a dividend is not yet lost. Mortality and fertility rates are still in decline, so Latin America can still benefit—but only if its policymakers act decisively and appropriately.

MIDDLE EAST AND NORTH AFRICA

Most countries in the Middle East and North Africa (MENA) are at relatively early stages of their demographic transitions, having achieved relatively high life expectancy. Across the region, life expectancy is 65 years: the world average. Fertility rates, however, remain relatively high, and, with a regional average of more than 4 children per woman, are second only to those in sub-Saharan Africa. In 1997, for example, the average woman in Jordan would have 4.7

[16]Latin America ranks worse than any other region except Africa on corruption indices (Inter-American Development Bank, 2000).

babies, while the comparable figure for Egypt is 3.4 and for Yemen is 7.6 (Population Council, 2001).

The region has also seen healthy economic growth over the last two decades, and some of this is due to the growth in the working-age population. In Egypt, the demographic transition through 1990 is estimated to have accounted for one-sixth of the growth of Egypt's income per capita between 1965 and 1990 (Bloom and Canning, 1999a). Jordan's transition started earlier, and the country will see dependency ratios falling from 1.0 in 1990 to around 0.48 in 2040. This has been estimated to account for nearly half of Jordan's projected per capita growth rate (Bloom, Canning, Huzarski, et al., 2000).

However, if fertility rates do not fall, the ratio of workers to dependents will not change dramatically, and the region will see population growth without the opportunity for dramatic economic growth. Models show that the effect of fertility rates on the annual growth rate of GDP per capita is substantial: In Syria, for example, economic growth could be stimulated significantly if the ratio of working-age to total population was changed through a low fertility rate—analysis suggests an effect as great as 1.62 percentage points on the annual growth rate of GDP per capita (Bloom and Canning, 1999b).

Policy will be a significant factor in determining whether MENA countries are to enjoy the demographic dividend. Openness to global trade, as well as policies to support employment and education, can help countries to absorb the baby-boom generation of workers into productive and remunerative employment. Saudi Arabia, for example, is currently facing the prospect of mass unemployment among graduates and school-leavers. Sixty percent of the current population is under 25. Some analysts blame foreign investment trickling out of Saudi Arabia, alongside an outdated education system, which has not equipped Saudi nationals for work in a global economy. Among other factors, some blame Saudi labor laws, which discourage private companies from employing Saudis because it is extremely difficult to dismiss a Saudi national who is not doing his job.

People are naturally enterprising, provided their opportunities to work are not stifled by bureaucracy, uncompetitive environments, lack of available capital for investment, or an absence of skills. The

region needs to work toward more liberal labor markets, while also investing in education and training to ensure wider access to opportunities. It will also need to encourage foreign and internal investment. If it can achieve these changes, combined with decreasing fertility, then the Middle East and North Africa could benefit from its demographic dividend; if it doesn't, it will increasingly face the problems that Saudi Arabia is struggling to resolve today.

SUB-SAHARAN AFRICA

This region has yet to experience the typical demographic transition. While mortality has declined, following the pattern in other areas (infant mortality in the region fell by 43 percent between 1960 and 2000), fertility has not (declining only 19 percent in the same period). Rather than a baby boom—where the number of births rises for a period before falling as fertility declines—this has resulted in an unprecedented population explosion, with the 1950 population expected to quadruple, to 718 million, by 2004. Dependency ratios have, unlike in all other regions of the world, correspondingly risen. Whereas most areas' working-age (15–64-year-old) population makes up 60 percent to 70 percent of the total, only 53 percent of sub-Saharan Africa's population is in this age group. Between 1965 and 1990, in the world as a whole, the working-age population grew 0.31 percentage points per year faster than the total population, whereas in sub-Saharan Africa it grew 0.08 percentage points slower than the total. With AIDS now killing off large sections of that working population and actually bringing average age down in many countries, the region has had no demographic dividend to reap.[17]

Although demographers tend to agree that sub-Saharan Africa will experience a fertility transition, there remain disputes concerning its timing, the reasons underpinning continued high fertility rates, and what the best interventions might be. As Bloom and Sachs have noted, "Africa's demographic uniqueness [over the past half century]

[17]In addition to its negative effect on workforce growth, adult AIDS mortality also has a negative effect on numbers of births because it has reduced the number of women of childbearing age. Although these effects operate in different directions with respect to the dependency ratio, our calculations indicate that the former effect outweighs the latter. See below, in this section's discussion of AIDS mortality data from Thailand.

… is *not* in the *level* of fertility but in the *persistence* of such a high level of fertility in the face of mortality declines" (Bloom and Sachs, 1998). High fertility has been the major component of Africa's sluggish demographic transition and a major cause of its rapid population growth. Compared with other developing regions in 1960, sub-Saharan Africa started with a slightly higher total fertility rate of 6.7 children per woman. By the mid-1990s, dramatic reductions had occurred elsewhere—to 3.0 children per woman in Latin America, 3.8 in South Central Asia, and 2.2 in East Asia. During that period, all three regions saw a surge in contraception use: The percentage of married women aged 15–49 using contraception rose from around 13 percent to 80 percent in East Asia, from 7 to 40 percent in South Asia, and from 14 to 67 percent in Latin America. The figures for sub-Saharan Africa over that time period are much less dramatic, rising from around 5 percent to just 18 percent (Goliber, 1997), with fertility falling only from 6.7 children per woman to 5.9 (United Nations, 2001). While some countries—in particular those of southern Africa (Namibia, Botswana, South Africa, and Zimbabwe) and Kenya—have achieved fertility reductions, the majority of sub-Saharan African countries still have very high fertility rates.[18]

There are various reasons for this continued high fertility. With limited financial infrastructure in rural areas offering little incentive or means to save, children are still viewed as insurance for old age. They are also a key source of labor. Furthermore, and despite medical advances, infectious disease is still widespread, particularly in rural areas, so cultural norms and policies encouraging high fertility in order to achieve desired family sizes (such as child fosterage, polygyny, and the distribution of land according to family size) are not changing much.

Africa is a continent of extremes, and in the last 30 years, it has faced a series of prolonged and debilitating wars. Wars not only kill and injure soldiers and civilians alike; they also destroy infrastructure and social structures, which in turn has a negative impact on a population's health. Life expectancy in Mozambique, for example, is now

[18]As Bloom and Sachs (1998) have said, "The youthful structure of Africa's population pyramid and the sluggishness of its transition to lower fertility rates indicate that African economies will be burdened by rapid population growth for several decades."

down to 38 years. We could argue, however, that the relationship between war and health runs two ways, creating a vicious spiral: Because a shorter life expectancy can lead to different perceptions of risk, it contributes to the belligerence of a population, and thus greater willingness to engage in war.

Another aspect of the problems facing sub-Saharan Africa is the virulence of infectious diseases. Despite some impressive health gains over the last century, malaria, HIV/AIDS, and tuberculosis are just three of the big killers that are not yet successfully controlled. Malaria and HIV alone currently account for 3 million to 4 million of sub-Saharan Africa's roughly 10 million annual deaths. HIV is particularly virulent in sub-Saharan Africa, where many countries have ten or more people living with HIV for each person who has already died from the disease. Between 1985 and 1995, more than 4 million sub-Saharan Africans died of AIDS. Fifteen million more deaths are expected by 2005, with 70 percent of the world's new infections and 80 percent of AIDS deaths occurring in sub-Saharan Africa alone. In December 1999, UNAIDS reported that 8.8 percent of adults in sub-Saharan Africa were HIV positive. The UN estimates that life expectancy today in sub-Saharan Africa is 7 years lower than it would be in the absence of AIDS. As a result of HIV/AIDS, the population of the 35 sub-Saharan African countries most affected will be 10 percent lower in 2015 than it otherwise would have been, despite continuing high fertility in the region (United Nations Population Division, 2001). The outcome of this is hard to predict, but the ratio of working-age adults to dependents will certainly continue to dwindle.

Furthermore, in addition to children and the elderly as dependents, many will be suffering the ravages of HIV disease in adulthood. Heterosexual sex is the dominant means of transmission, and the majority of people dying of AIDS are between 20 and 59 years of age. In other words, it is a disease that particularly hits those who should be economically productive—and threatens not only health, but also the economic stability and potential of a country (Bloom, Bloom, and River Path Associates, 2000; Bloom, Mahal, Sevilla, et al., 2001).

Data are far from adequate, but calculations made for Thailand may be instructive for understanding the potential economic effect of AIDS in sub-Saharan Africa. Thailand's ratio of working-age to total population is projected to be 0.70 in 2015 (United Nations, 2001). We

estimate that cumulative AIDS deaths by that year will be about 1 million, a relatively small number because risky behaviors have declined as a result of Thailand's highly successful anti-HIV policies. At Thailand's current prevalence rate, still among the highest outside Africa at an adult rate of 2.15 percent, the impact on GDP is minimal. By contrast, if we simulate the Thai AIDS epidemic in the absence of the substantial behavioral improvements that actually occurred, AIDS deaths by 2015 could reach 10 million. In addition, if we take into account the number of children that would not have been born because of these deaths, the population would be estimated to be about 11.6 million smaller than it otherwise would have been. The net effect would be to reduce the working-age population by 9.95 million by 2015 (to 67 percent of the population). This decline could reduce the annual growth rate in per capita GDP by about 0.65 percentage points from a projected annual rate of 3.46 to 2.81 percent. As a result, the level of GDP per capita in 2015 would be $1,272 lower than its projected $8,500.

This example demonstrates that an unchecked AIDS epidemic—as some African countries are experiencing—can have a substantial effect on the growth of income per capita because it is so highly concentrated in working-age individuals.

Ill health undermines a nation at every level, and precipitates and contributes to a vicious downward development spiral. Poverty increases susceptibility to illness, itself a prime cause of poverty. High mortality and fertility rates discourage investment in human capital: A family cannot afford to spend its limited resources on only 1 or 2 children, because their survival rate is relatively low. The reduced incentive to invest in the future threatens the economy as well as the political stability of a nation. The UN Security Council recently acknowledged the seriousness of the situation when the impact of AIDS on Africa's peace and security made the agenda on January 10, 2000: the first time in over 4,000 debates that the Council had addressed a health issue. UN Secretary-General Kofi Annan has also given the issue prominence, reporting in his millennium statement that "the pandemic is destroying the economic and social fabric in the countries most affected, reversing years of declining death rates and causing dramatic rises in mortality among young adults" (United Nations, 2000, p. 28).

As long as fertility remains high and families have large numbers of children, sub-Saharan African countries are unlikely to see rising incomes or healthier and better-educated workers. Poverty, low educational attainment, and poor health outcomes across much of sub-Saharan Africa will slow fertility decline. Despite these problems, the fertility rate is expected to fall from 5.5 children per woman to 3.5 in the next 25 years (United Nations, 2001). Still, a potential virtuous spiral has inverted and there are no simple solutions for dramatically speeding a rise in incomes. There are opportunities to tackle this, however, and perhaps the most promising is that of gender: If policymakers can urgently place much more emphasis on educating and empowering African girls, who ultimately represent one of the continent's most important sources of economic and social progress, they can expect their countries to reap corollary rewards.

One other possible trend deserves mention: that of substantially increased migration from sub-Saharan Africa to Europe, discussed in some detail in Hatton and Williamson (2001). Two forces are working together to impel such migration: (a) wage rates are much higher in Europe than sub-Saharan Africa; and (b) the two regions are at totally different, but complementary, points in the demographic transition: specifically, sub-Saharan Africa has a huge percentage of young people and Europe currently has a high proportion of working-age individuals. The ratio of working-age to non–working-age individuals is reasonably constant over time when the total population of Europe and Africa are combined. However, the ratio trends upward in Africa for many decades to come, but downward in Europe after 2010. This pattern suggests, at first, that migration of workers from sub-Saharan Africa to Europe could be beneficial for the economies of both regions. In practice, European restrictions on immigration are likely to hold down the number of Africans who succeed in emigrating to Europe. Even if we make the implausibly high assumption that 1 million sub-Saharan Africans of working age moved to Europe each year from 2000 through 2024 (which would be on the order of a tenfold increase over current levels[19]), then the ratio of working-age to

[19]Current data are difficult to find, but the Netherlands Interdisciplinary Demographic Institute states that "annual migration from sub-Saharan Africa increased dramatically, from 15 thousand people in 1985 to 82 thousand in 1993." See Netherlands Interdisciplinary Demographic Institute (1998).

non–working-age people in Europe would still fall (from 2.02 in 1995 to 1.97 in 2025), but not by nearly as much as it would (to 1.85 in 2025) in current UN population projections.[20] That difference would matter to some extent, but more likely assumptions about the level of immigration will show that it will be difficult to significantly affect this ratio in Europe. Of course, such a scenario would have enormous cultural, economic, and political effects in sub-Saharan Africa.

EASTERN EUROPE AND THE FORMER SOVIET UNION

Patterns of fertility in Eastern Europe have historically been very different from those in the West. Fertility rates fell throughout the 20th century, with only a slight increase after World War II, quickly followed by further declines after abortion was legalized in the 1950s (seven out of every ten Russian pregnancies end in abortion, although increased contraceptive use has recently begun to push abortion rates down) (DaVanzo and Grammich, 2001). The fertility rate in Russia has fallen from 7 children per woman to 1.1 in the last 100 years (Zakharov and Ivanovna, 1996; Institut National d'Etudes Demographiques, 2000). Latvia, Bulgaria, Ukraine, Slovenia, the Russian Federation, and Czech Republic all currently figure in the ten lowest-fertility countries in the world, with rates well below replacement levels (United Nations Population Division, 2001). The 13 non-island countries with the lowest population growth rates are all found in this region, with Estonia, Georgia, Bulgaria, and Ukraine seeming likely to remain at very low rates for at least the next two decades.

Rising death rates have sped up population decline. A high level of alcohol abuse has contributed to a steep rise in cardiovascular diseases, circulatory problems, and violence, and the death rate among working-age Russian males in particular has soared. Furthermore, health systems in the region have deteriorated, leading to the spread of both old infectious diseases like tuberculosis, and new ones like HIV/AIDS. Reported HIV infection rates in Eastern Europe and the

[20]In the interest of simplicity, this calculation assumes that African immigrants all remain in the working ages through 2025 and that they do not bear children in Europe. Modifying either of these assumptions suggests that the age distribution benefits of African migration to Europe would be even smaller.

former Soviet Union rose by 67 percent between the end of 1999 and the end of 2000, with the number of new infections in the Russian Federation in 2000 alone almost double the total number reported in the previous 12 years (UNAIDS, 2000).

The United Nations posits that total population sizes will continue to fall for the next 50 years, despite the fact that fertility rates are projected to rise by 2025. Russia's population is projected to fall from 144 million today to 104 million in 2050, for example, and Ukraine's to drop from 50 million to 30 million over the same period (United Nations, 2001). This down-then-up pattern of fertility, coupled with heightened mortality, help explain why Eastern Europe, and Russia in particular, have experienced—and will likely continue to experience—very different demographic changes from those of other world regions. In the next 50 years, Russia will see a growth in its elderly population and a shrinkage in its working-age and youth populations (although the proportion of working-age people in the population will not decline dramatically). Health systems in the region are struggling to keep up with the illnesses affecting the population today, and as that population ages, the pressure will be even greater. In addition, if the adult death rate maintains its current high levels, the future elderly population will not grow as much as it would have otherwise. (For more details about demographics in Russia, see DaVanzo and Grammich [2001] and Bennett, Bloom, and Ivanov [1998].)

Relative to other parts of the world, Russia has had a high working age share since at least 1950. We do not have data on its age structure during the decades of its most rapid economic growth, so we cannot draw any conclusions about the relationship between its demography and its economic growth at that time. From 1950 on, however, we know that the high working-age share should have given the Soviet Union a significant economic boost. Instead, after having caught up, the country fell behind the capitalist world economically, to a greater degree than virtually anyone had anticipated. Although it is difficult to sort out causality, it is clear that the high working-age share was not translated into robust economic growth, presumably the result, at least partly, of a state-driven economy insulated from market forces. In other words, like Latin America, Russia has failed to benefit economically from its high working-age share.

Policy issues in this region are complex in light of demography. The first priority must be health. The rise in death rates needs to be reversed and governments should take urgent action to prevent the spread of HIV/AIDS via both education and condom distribution. Vulnerable groups, such as drug users and sex workers, should be targeted, with business encouraged to play a role in prevention efforts. As several companies in Africa and Thailand have shown, the private sector can play a useful role in AIDS efforts, bringing its skills to the problem and helping to ease the burden on health systems (Bloom, Mahal, and River Path Associates, 2001).

In short, the region is likely to be best served by focusing on health, social well-being, and the economy as a means of reaching long-term demographic stability and positioning itself to cope with an aging society.