

**Aging Societies with Fewer Children in East Asia and
Changes in Social Structure**

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March 2003

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Introduction – Demographic trends and economic development in Asia

Some countries in East Asia and Southeast Asia, including Japan, benefited from a “demographic bonus” between the 1960s and 1990s. It is said that Asia achieved sustained economic growth, known as the “Asian miracle,” partly on the back of the “demographic bonus.” “Demographic bonus” refers to the increased possibility of economic growth, as the growth rate of labor force exceeds that of total population due to changes in population composition and birth and death rates. Bloom and Williamson (1997) estimated that demographic changes accounted for one quarter to one third of per-capita GDP growth in East Asia. Krugman’s (1994) article “The Myth of Asia’s Miracle” published in *Foreign Affairs* stressed contributions made by increased labor force in achieving economic growth, helping to revive interest in the demographic contribution to economic growth in Asia, while this has always been a major research theme in population economics.

“Demographic bonus,” a phrase used by Mason (1997), became known after the United Nations Population Fund (UNFPA 1998) used it in the *State of World Population 1998*. The report also used “workforce bulge” virtually as a synonym with “demographic bonus.” It is also sometimes used interchangeably with “window of opportunity,” (e.g., Birdsall and Sinding 2001). In recent years, “demographic dividend” has often been used. The phrase, first used by Bloom et al. (2002), seems to have been coined to replace “demographic gift” (e.g., Bloom and Williamson 1997; Williamson 2001). UN agencies involved in population issues tend to use “demographic bonus” more often. On the other hand, the Asian Development Bank’s (2002) *Key Economic Indicators for 2002* and the World Bank’s (2002) *World Development Report 2003* opted mainly for “demographic dividend.” In any case, these phrases are increasingly used in accordance with a growing number of research on demographic contribution in bringing about economic growth in Asia.

The Future of Population in Asia published by the East-West Center (2002) argues that Japan, South Korea, Taiwan (Taipei, China), Singapore, Thailand and Indonesia succeeded in attaining economic growth after the early 1960s despite concerns about

negative impacts of a growing population on economic growth and partly because a rapid decline in the birth rate helped curb population growth, partly because these economies benefited from good opportunities conducive to economic growth thanks to effective development policies under favorable international economic environments and changes in population composition and birth and death rates. Good opportunities appeared in three forms: a) a large gap between growth rates of total population and potential labor force, b) policy incentives and changes in age composition, which encouraged higher saving and investment rates; and c) policy incentives and changes in age composition, which led to increased human capital.

The EWC report said that potential labor force expanded in the six Asian countries, thanks to lower birth and death rates and the rising rates of female labor force participation (partly due to later marriages and lower birth rates). This “demographic bonus” pushed per-capita income up by 0.8% a year. All the six countries underwent the three stages described below. During the first stage, the dependent population (child and aged population) increases faster than the “working-age population (aged 15-64),” as lower infant and child mortality rates result in an increase in the “child population” (below 15 years of age). During the second stage, a lower birth rate stabilizes or even reduces the child population, while an increasingly larger part of child population that increased in the first stage starts to join the working-age population, making the working-age population grow faster than the dependent population. During the third stage, the child population either stabilizes or declines and the increase in working-age population begins to slow down, while the growth of “aged population” (aged 65 and above) picks up. The six countries remained in the second stage between 1960 and 1990. But Japan has already entered the third stage, with the others following suit.

The EWC report points to changes in age composition and birth and death rates as conditions conducive to saving and investment, the second good opportunity for economic growth. The decline in the number of children reduces child-rearing costs and makes it possible to save more. On the other hand, longer life expectancy and a lower average retirement age mean longer expected life after retirement, a factor that encourages saving, resulting in the deepening of capital. The report also says that

increased per-capita investment in education and health at the household and national levels as a result of a lower birth rate are conducive to investment in human capital, although there is some 20-year gap between the falling birth rate and effects of investment in human capital to be felt.

Since economic growth will be dealt with in other chapters, let us focus on changes in the size and structure of population. In particular, attention will be centered on “demographic bonus,” demographic transition from high birth and high death rates to low birth and low death rates, which led to a “demographic bonus,” resultant aging societies with fewer children (changes in age composition due to lower birth and death rates) and eventual changes in the socio-economic structure (income and education gap).

1. Size and structure of population and their trends

(1) Trends in the size of population

Table 1 shows changes in the size of the population of countries in East Asia and Southeast Asia between 1950 and 2050, based mainly on population estimates and projections revised by the UN Population Division in 2002 (UN 2003). The population estimates and projections for Taiwan made by its government are listed separately, although Taiwan is included in China under the UN estimates and projections. In short, China will continue to have the largest population in this region (the largest in the world until it is overtaken by India around 2030), with its population having more than doubled to 1160 million in 1990 from 550 million in 1950. China has seen growth of its population slow down in recent years. Its population is projected at 1400 million in 2050, as it will start declining after peaking at 1450 million in 2030. Indonesia, the second most populous country in the region in 2000 with the population of 210 million, had a population of 80 million in 1950, slightly smaller than that of Japan. Indonesia is expected to report relatively sharp growth in its population, which is projected to exceed 290 million in 2050. In contrast, Japan, the second most populous country in the region with a population of 84 million in 1950, was ranked third in 2000. Japan’s population is expected to start falling soon and at 110 million in 2050, it is expected to be overtaken by the Philippines and Vietnam, the two countries whose population continues to increase

rapidly. Thailand's population was on a par with that of the Philippines in 1950-1970. However, the country is projected to have 50 million fewer people than the Philippines by 2050 due to sluggish population growth.

Changes in the size of each country's population reflect differences in the average annual population growth rates in these countries (regions), as shown in Table 2. East Asian countries saw their population growth start to decline relatively early, with the exception of Mongolia, Hong Kong (S.A.R.) and Macao (S.A.R.). The growth rates are projected to contract to close to zero before eventually going into the negative territory. In contrast, Southeast Asian countries excepting Thailand have reported high population growth until now. Except for Thailand and Singapore, whose population is expected to shrink, Southeast Asian countries are projected to maintain relatively high population growth, albeit at a slower pace. To summarize, in addition to Japan, the countries that have been enjoying rapid economic growth in recent years, such as NIEs (South Korea, Taiwan, Hong Kong and Singapore), China and Thailand, are reporting low population growth and expect to record negative growth in future. As generally assumed, rapid economic growth appears to have brought about the slowdown in population growth.

(2) Trends in working-age population

On the other hand, as stated before, it is also highly likely that these countries benefited from the "demographic bonus" of labor force increasing faster than total population during the phase of population growth and achieved rapid economic growth thanks to favorable political and economic environments, as well as appropriate public policies. Table 3 shows changes in the percentage of working-age population aged 15-64 in countries (regions) in East Asia and Southeast Asia. In East Asia, except for North Korea and Japan, the two countries that reported the lowest percentage in 1950, the other countries posted the lowest percentage of working-age population around 1965. Southeast Asian countries recorded the lowest levels in 1965-1975, excepting Laos, whose percentage was at its lowest in 1985. In other words, these countries incurred the highest dependency burden during these periods, an indication of difficulties in achieving economic growth. Studies of the countries that have experienced sustained rapid

economic growth suggest that, in the absence of political unrest, rapid economic growth began when the proportion of working-age population reached some 65%. If this trend continues in future, rapid economic growth will likely begin in Mongolia, Indonesia, Vietnam, to be followed by Malaysia and the Philippines. Among these countries, however, Malaysia already reported relatively rapid economic growth during the 1980s. Whether the other countries will enter a period of rapid economic growth also depends on their political and economic conditions. It usually takes 30 years for the percentage of working-age population to reach its highest level after attaining the 65% mark. But this formula does not seem to fit some countries.

Table 4 shows the difference (in percentage) between annual growth rate of working-age population and that of total population in countries (regions) in East Asia and Southeast Asia, which appear to be a more accurate indicator of “demographic bonus.” Positive figures show that the working-age population is growing faster than the total population, indicating that the country in question is benefiting from “demographic bonus.” The table shows that a difference of more than 1% seems to be a necessary condition for economic growth to take off. In East Asia, the difference exceeded 1% in China in 1975-1985, in Hong Kong in 1970-1980, in Macao in 1965-1980 and in 1995-2005, in North Korea in 1975-1985, in Japan in 1960-1965, in Mongolia in 1990-2005, in South Korea in 1970-1990 and in Taiwan in 1965-1975. The majority of countries had a gap of more than 1% for some 10 years, except for only five years in Japan, while the gap lasted for 20 years in South Korea. It appears certain that one of the necessary conditions for the “miracle of the Han” as well as “Asian miracles” was “demographic bonus.”

As far as the percentages of working-age population shown in Table 3 are concerned, it is not unreasonable to assume that Malaysia has yet to enter a period of rapid economic growth. On the other hand, Table 4 shows that Malaysia had a difference of slightly more than 1% between the two growth rates in 1975-1980. But the fact that a small gap lasted only five years may be one of the reasons the country failed to sustain economic growth comparable to that of Singapore or Thailand. Singapore had such a gap in 1965-1980 and Thailand in 1975-1990. The absence of sustained economic growth in Malaysia can also

be attributed to the country's New Population Policy adopted in 1984, which targeted a population of 70 million in 2100. Vietnam also reported a gap of slightly more than 1% in 1995-2000 and expects it to widen in the following five years. The country's actual economic growth can be explained better with it, rather than with the percentage of working-age population.

2. Demographic transition and trends in components of population change

(1) Demographic transition

Many countries in East Asia and Southeast Asia have either already shifted from high birth (fertility) and death (mortality) rates to low birth and death rates or are close to completing the transition. The demographic transition theory as empirical generalization says that the actual population shifts from a phase of high birth and death rates to a next phase of falling mortality, followed by declining fertility, before entering a phase of low birth and death rates. Transition follows such a sequence, as improved living and hygiene standards first lead to lower mortality among infants and young children and people begin to give birth to fewer children only after they realize more children can survive. Potential demand for fertility regulation can benefit from easier access to birth control methods through family planning programs.

There is only a small difference between the birth rate and the death rate in the first and the last phases of "demographic transition," and population growth is marginal as a result. However, population grows sharply during the middle phase, as the birth rate does not fall as fast as the death rate or the birth rate can even rise temporarily. During this phase, the declining mortality is mainly accounted for by falling death rates among infants and young children. Together with a high birth rate, this leads to a sharp increase in child population and dependency burden. With the passage of time, an increasingly larger part of child population begin to join the working-age population from the end of the middle phase till the early stage of the last phase, while a low birth rate results in a falling number of those joining the child population, enhancing the possibility of benefiting from "demographic bonus." The gap in growth rates of more than 1% between the working-age population and the total population seen in the countries (regions) that

experienced rapid economic growth must have been determined by the levels of birth and death rates prior to and after the decline in these rates, as well as by the connection between the extent and the speed of the decline in birth and death rates.

In order to understand relative conditions before and after the “demographic transition” begins, let us look at Table 5, a table of countries (regions) in East Asia and Southeast Asia classified by total fertility rate and infant mortality rate in 1950-1955. Total fertility rate is the number of children an average woman would bear in her life in accordance with prevailing age-specific birth rates. In a society where the death rate has fallen to a certain level, its population would be reproduced if all women bear 2.1 children. Therefore, the total fertility rate of 2.1 is considered the replacement level. Since there was no country in Asia with total fertility rate below 2.1 in 1950, the first dividing line was set at 3.1, with other lines set 1 or 2 apart to even out the number of countries in each cell. Infant mortality rate is the number of deaths of children less than 1 year old per 1000 live births during a specific time period, representing the approximate probability of newborns not living to their first birthdays. Since a society with a high infant mortality rate has a high death rate for other age groups accordingly, countries with a high infant mortality rate tend to have shorter life expectancy at birth.

Japan, the country where the “demographic transition” started earlier than others, still had relatively high total fertility rate and infant mortality rate in 1950-1955, compared with the levels reported by developed countries today. Japan at that time was close to where Indonesia was in 1995-2000, as shown in Table 6. On a diagonal line from the cell containing Japan and in cells to the right of the diagonal line are the countries (regions) that have become known as NIEs as a result of rapid economic growth and those following the lead of NIEs, reminding one of “flying geese pattern.” On the other hand, North Korea and Mongolia failed to achieve sustained economic growth, despite the fact that they were fairly close to Japan on the diagonal line. Could it be because appropriate public policies were not implemented due to their political system? NIEs still had a high birth rate, although the death rate had already started to fall. A sharp decline in the birth rate came at a later stage. In the Philippines, the birth rate was much higher than the level expected from its infant mortality rate and remained relatively high, a factor that

hindered the country's economic growth and one of the reasons behind a large exodus of migrant workers abroad.

In order to understand relative conditions before and after the “demographic transition” is completed, let us move on to Table 6, a table of countries in East Asia and Southeast Asia classified by total fertility rate and infant mortality rate in 1995-2000. Please note that dividing lines for total fertility rates and infant mortality rates in Table 6 differ considerably from those in Table 5, due to a sharp decline in birth and death rates. This is because “demographic transition” started in all countries, not to mention Japan, the country that entered the second phase half a century ago, and that many countries either completed or were close to completing the transition. Japan and NIEs have entered into the “second demographic transition,” in which their total fertility rate is much lower than the replacement level of 2.1, with a considerably low infant mortality rate and considerably long life expectancy at birth. Total fertility rate in Thailand, China and North Korea is below the replacement level, but their infant mortality rate is somewhat high and their life expectancy at birth is on the short side. Meanwhile, oil-rich countries of Brunei and Malaysia have seen their infant mortality rate decline partly due to policies financed by oil money. Their total fertility rate is slightly higher than the replacement level, as they have adopted policies to encourage births. On the other side of the spectrum are Cambodia, Laos and Myanmar, where both total fertility and infant mortality rates are high and life expectancy at birth is short. In between are countries that have achieved socio-economic development to a certain degree, such as Indonesia, Vietnam and the Philippines. In short, as the comparison of Table 5 and Table 6 clearly shows, “demographic transition” has been virtually completed in East Asia, while many countries in Southeast Asia have either completed the transition or are close to completing it.

(2) Trends in components of population change: fertility

Let us now examine fertility, one of the components of population change because its decline resulted in “demographic transition.” Table 7 shows changes in total fertility rates in East Asia and Southeast Asia, based mainly on estimates and projections by the UN

Population Division. As illustrated in Table 6, Japan and NIEs had total fertility rate below 1.8 in the second half of the 1990s. No country (region) other than Japan had a total fertility rate below the replacement level of 2.1 in the first half of the 1970s. Macao and Singapore joined the low fertility group in the second half of the 1970s, followed by Hong Kong in the first half of the 1980s, South Korea and Taiwan in the second half of the 1980s. China joined the group in the first half of the 1990s, while North Korea and Thailand did so in the second half of the 1990s. No other country is expected to have total fertility rates below the replacement level in the near future. The total fertility rates in Brunei and Vietnam are projected to drop below the replacement level in the first half of the 2010s, followed by Mongolia and Indonesia in the latter half of the decade. Myanmar is expected to follow suit in the first half of the 2020s, while Malaysia and the Philippines will likely do so in the second half of the 2020s. This will leave only East Timor and Laos in the high fertility group. Past cases show that total fertility rates fall below the replacement level when the proportion of working-age population (15-64) exceeded 60-65%. The level around 65% will likely remain the threshold in the future. Fertility decline is in part attributed to higher living standards and in part results from appropriate public policies, especially family planning programs.

There are various theories regarding factors that cause fertility to decline. According to the often-quoted analytical framework for fertility in a NAS (National Academy of Sciences) report (Bulatao and Lee 1983), fertility behaviors are directly determined by fertility regulation behaviors and the latter are determined by the motivation for and costs of fertility regulation. The motivation for fertility regulation is determined by demand for and supply of children. Taste and constraints affect the perception of children (value and disvalue), which in turn affects aspiration for the number of children, thereby creating demand for children. Demand for children consists of “natural fertility” without deliberate control by party (birth order) and the survival of children. The former includes proximate determinants, such as amenorrhea (absence of menstruation) through breast-feeding, waiting time for conception, intrauterine mortality, permanent infertility and entry into a reproductive period. Costs of fertility regulation consist of costs of acquisition and costs of utilization. Furthermore, demand for and supply of children and

fertility regulation costs are determined by macro-level factors, such as social systems, cultural norms and economic and environmental conditions, micro-level characteristics of individuals and households, and reproductive history (marriage and child-bearing). Costs of fertility regulation are determined by the supply of fertility regulation methods, which is determined by public policies included in macro-level factors, with family planning programs playing a major role. Family planning programs not only directly affect motivation for fertility regulation and supply of fertility regulation methods but also have an indirect impact on supply of and demand for children.

Similarly, governments' policies and measures on fertility are determined by their perceptions of their country's fertility level in the light of socio-economic indicators. It also appears to dictate whether or not to implement fertility policies and whether or not to provide contraceptives through family planning programs. Table 8 shows the results of a survey of governments around the world regarding population policies, conducted by the UN Population Division in 1976, 1986, 1996 and 2001. Specifically, the table shows each government's view on its fertility level for each year (too high, satisfactory or too low), whether a government in question has fertility policies, and if so, what kind (policies to raise fertility, policies to maintain fertility, policies to lower fertility or non-intervention), whether a government in question support the supply of contraceptives and if so, how (direct support, indirect support, no support or limits). It also lists the annual total fertility rate for the period preceding each survey year. Unfortunately, we do not have information for all the countries examined in the previous tables. But it is obvious that a government's view on its fertility level does not necessarily reflect the actual fertility level during the period preceding each survey year, let alone across countries. With total fertility rates below 1.5 and 1.8 respectively in the 1990s, Japan and Singapore were justified in regarding their fertility too low. But it is hardly appropriate of Mongolia and Cambodia to have a similar view, when Mongolia had a total fertility rate above 5.0 in 1986 as well as Cambodia in 1976 and 1986. Similarly, countries with a considerably high fertility cannot be right in regarding their fertility level satisfactory.

The same thing can be said of the existence and types of fertility policies listed in Table 8. It was appropriate that China implemented policies designed to lower fertility

during the period of high fertility and adopted policies aimed at maintaining fertility when the fertility fell. But implementing fertility maintenance policies or non-intervention despite a high level of fertility is virtually tantamount to adopting policies to raise fertility. It was appropriate of Singapore to adopt policies to raise fertility from 1986 when the fertility was low. But it is hardly appropriate of Mongolia in 1986 and Cambodia in 1976 and 1986 to have pursued policies to raise fertility. Malaysia said in 1986 that the country was implementing policies to maintain fertility. However, considering that these policies were at odds with the previous or subsequent policies, the author suspects that the country was actually pursuing policies to raise fertility. Mongolia in 1976 and Laos before 1996, both with high fertility, said that they were pursuing policies to maintain fertility. In fact, the two countries virtually had policies to raise fertility in force.

An overwhelming majority said that they were providing direct support for access to contraceptives. Brunei can be said to have pursued policies to raise fertility in effect, as the country provided no support for access to contraceptives, although it opted for no intervention in the sphere of fertility policy. The same thing can be said of Laos, which switched from limiting access to no support. Meanwhile, it can be assumed that Myanmar became able to afford offering support, when it switched from no support to indirect support and direct support eventually. On the other hand, it is possible that Japan switched from direct support to indirect support in 2001 with a view to raise fertility.

Indonesia, the Philippines and Vietnam are the three countries that viewed their fertility too high, kept policies to lower fertility in force, and continued to give direct support for access to contraceptives throughout the period covered in Table 8. Unlike Indonesia and Vietnam, where total fertility rate fell steadily, the Philippines still has a relatively high rate because of a modest decline, although the country had a lower rate than Vietnam in the first half of the 1970s. This is partly because the majority of Filipinos are Catholic and the Catholic church favors policies to raise fertility. Catholics tend to encourage births and resist restricting births. In contrast, the majority of Vietnamese people are either Buddhist or practice no religion. With Catholics a minority in Vietnam, there was not much resistance to policies to lower fertility from a religious point of view.

In Indonesia, the majority are Muslim. Since Islam tolerates contraception and the Indonesian government obtained approval from prominent religious leaders and involved local religious leaders to promote family planning programs, there was little resistance to contraception. Indonesia saw its total fertility rate fall sharply, in contrast with Malaysia, the country with religious and racial similarities that implemented policies to raise fertility temporarily.

(3) Trends in components of population change: mortality

Let us now examine mortality (focusing on, infant mortality rate and life expectancy at birth), another component of population change because its decline also brought about “demographic transition.” Similar to Table 7, Table 9 shows changes in infant mortality rate in East Asia and Southeast Asia, based mainly on the UN Population Division’s estimates and projections. Japan, NIEs and Brunei had infant mortality rates below 10 per thousand in the latter half of the 1990s, as shown in Table 6. But no country but Japan had an infant mortality rate below 10 in the latter half of the 1970s. Hong Kong and Singapore joined the low infant mortality group in the first half of the 1980s, followed by Taiwan in the second half of the 1980s. Macao and Brunei joined the group in the first half of the 1990s, while South Korea did so in the second half of the 1990s. Malaysia is expected to join the group in 2005-2010. No country is likely to follow suit for years until Thailand joins the group in the first half of the 2030s and the Philippines in the first half of the 2040s. Infant mortality rate in the other countries is projected to remain above 10 until 2050. Higher standards of living and improved hygiene through appropriate public policies are cited for the declining infant mortality rate.

According to the analytical framework for child health and mortality proposed by Mosley and Chen (1984), background socio-economic factors affect health (illness), growth faltering and mortality through five proximate determinants. These are a) maternal factors (age, parity, birth interval), b) environmental contamination (air, food, water and fingers, skin, soil and inanimate objects, insect vectors), c) nutrient deficiencies (calories, protein and micronutrients), d) injury (accidental, intentional), and e) personal illness control (personal preventive measures, medical treatment).

Socio-economic factors comprise independent variables, including those at the individual, the household and the community levels. Variables at the household level consist of food, water, clothing and bedding, housing, fuel and energy, transportation, hygienic and preventive care, sickness care and information. Following the fertility decline, many countries (regions) in East Asia and Southeast Asia must have seen maternal factors among proximate determinants move in the positive direction to benefit mothers, such as the decline in child-bearing at a late age, fewer children ever born and a longer birth interval, helping reduce the infant mortality rate. As for b) environmental contamination, both positive and negative changes took place. There were positive changes for c) nutrient deficiencies, d) injury and e) personal illness control. Improvements in these various factors not only affected the infant mortality rate but also the death rate at each age, causing life expectancy at birth to lengthen.

Similar to Table 9, Table 10 shows changes in life expectancy at birth in East and Southeast Asia, based mainly on estimates and projections by the UN Population Division. Japan, NIEs and Brunei had life expectancy above 75 years in the late 1990s, as illustrated in Table 6. No country other than Japan had life expectancy at birth above that level in the second half of the 1970s. Hong Kong joined the group of countries with a long life expectancy in the first half of the 1980s, followed by Macao in the second half of the 1980s, Singapore in the first half of the 1990s, and Taiwan and Brunei in the second half of the 1990s. South Korea is projected to join the group in 2000-2005 and Malaysia will likely do so in 2010-2015. But no other country is expected to follow suit until the Philippines, Thailand and Vietnam are expected to do so in the second half of the 2020s. China and Indonesia will likely join the group in the second half of the 2030s, while Mongolia is expected to do so in the first half of the 2040s. Life expectancy at birth is projected to remain below 75 years in the other countries until 2050. Just like the falling infant mortality rate, longer life expectancy is attributed to higher living standards and improved hygiene through appropriate public policies.

The comparison of Table 9 with Table 10 shows that changes in the infant mortality rate do not necessarily move in tandem with changes in life expectancy at birth. Also, as shown in Table 6, Thailand's life expectancy at birth is not very long, despite a relatively

low infant mortality rate. Such a gap is attributed to age-specific death rates being out of proportion to the infant mortality rate and differences in the causes of deaths. In the case of Thailand, the gap can be partially blamed on a relatively large number of people infected with HIV/AIDS in recent years. According to the UN (2003) estimates of projections, the percentage of Thai people infected with HIV/AIDS among those aged 15-49 peaked at 2.4% in 1994 before falling to 1.8% in 2001. It is estimated that Thailand's life expectancy at birth in 2000-2005 is almost four years shorter than it would be, had the country not been affected by HIV/AIDS. Cambodia is expected to peak at 2.9% in 2004 and Myanmar in 2011, with the life expectancy of the two countries projected to be two years shorter than it would be without HIV/AIDS. China is projected to suffer the spread of HIV/AIDS in years to come, with the worst to come at 1.1% in 2016. Although the country's life expectancy at birth in 2000-2005 is almost the same as that without the impact of HIV/AIDS, it is projected to be one year shorter than it would be, had the country not been hit by HIV/AIDS. The number of deaths from HIV/AIDS in China totalled some 440,000 in 1980-2000, almost half of some 860,000 deaths reported in Thailand, three times the number of deaths in Myanmar and 12 times as many as in Cambodia. Due to a much larger population than in Thailand, the number of deaths from HIV/AIDS in China is projected at some 5.69 million in 2000-2015, almost five times the number of deaths in Thailand and Myanmar and 16 times as many as in Cambodia. Appropriate public policies would have helped curb the number of deaths from HIV/AIDS in China, in view of the Chinese government's handling of SARS in March 2003. But if the Chinese government applies the lesson it learnt from the handling of SARS, the number of deaths could be kept far below the UN estimates and projections.

3. Aging societies with fewer children

(1) Baby bust

A phrase "an aging society with fewer children (a baby bust)" has been increasingly used in recent years in Japan. Although "aging" is a technical term used in population studies to illustrate a higher percentage of elderly people, "baby bust (trend toward fewer children)" is not so much a demographic term as a phrase often used by government

agencies. As far as the author knows, the phrase first appeared in the Japanese government's White Paper on National Life for fiscal 1992. It said that a falling birth rate and a subsequent decline in the number of children in families and the society, in other words, trend toward fewer children and its impact began to draw attention (Economic Planning Agency 1992). Japan and NIEs are increasingly sounding alarms over a baby bust.

Table 11 shows changes in the percentage of child population below 15 of age in East Asia and Southeast Asia between 1950 and 2050, based mainly on estimates and projections by the UN Population Division. The proportion was below 35% in China, Hong Kong, Macao and Vietnam in 1950, with Japan reporting a slightly higher percentage. The percentage in these four countries (regions) started to fall after rising between 1960 and 1970, while Japan saw the percentage steadily decline over the years to dip below 15% in 2000. Hong Kong is the only other region that fell below 20% as of 2000, with South Korea, Taiwan and Singapore reporting a percentage below 22% and Macao a level slightly higher than that. The percentage of child population under 15 of age shrank in all countries in East Asia and Southeast Asia between 1995 and 2000, signalling the onset of a baby bust. Although the percentage of child population will unlikely decline so rapidly in Japan, a growing number of countries, mainly NIEs, are projected to report the proportion below 15% in future. Other countries will also likely suffer a sharp decline in the proportion of child population, with only Cambodia, East Timor and Laos projected to maintain a percentage of child population above 20% in 2050.

Among the countries facing a drastic decline in the proportion of child population, Japan reported a total fertility rate of 1.33, South Korea 1.30, Taiwan 1.40, Hong Kong 0.93 and Singapore 1.41 in 2001. Excluding Hong Kong and Macao, South Korea had the lowest total fertility rate among countries in East Asia and Southeast Asia. But the total fertility rate of Chinese Singaporeans, who account for 77% of the country's total population, was even lower than that of Japan or South Korea at 1.21. Japan posted the total fertility rate of 1.32 on a provisional basis in 2002, Taiwan 1.34, Hong Kong 0.96 and Singapore 1.37. With South Korea reporting 1.17 on a provisional basis for 2002, the

country appears to have dipped further than Chinese Singaporeans. The sharper fertility decline in NIEs than in Japan is partially blamed on improved standards of living thanks to sustained economic growth promoted by the “demographic bonus.” It is also attributed to a huge success of family planning programs in these countries, which helped curb the birth rate rapidly and achieve a “demographic bonus.” Although Singapore removed its family planning program in the 1980s, South Korea and Taiwan kept them in force until the 1990s.

Singapore carried out a family planning program designed to lower fertility from the second half of the 1960s until the mid-1980s, when the government reversed its fertility and family policies and offered various incentives to encourage couples to have three or more children, if financially possible, instead of stopping with two children. This is partly because Singapore had a total fertility rate lower than the replacement level for almost 10 years. In addition, its 1980 census showed that women with higher academic qualifications gave birth to fewer children, causing concern about quality, rather than quantity, of the population. The Singapore government continued to revise and add various incentives. Currently, the government provides a “baby bonus” to a second and a third child and offers paid maternity leave for a third child (Yap 2003). Although the total fertility rate among Malay Singaporeans rose to a certain extent possibly in response to the government measures, the total fertility rate among Chinese Singaporeans has continued to fall except for a period of temporary increase to a level lower than in Japan. Alarmed by the drop of its total fertility rate below the Japanese level in 2001, South Korea also started to prepare measures designed to arrest the falling fertility. However, their impact may be limited, as illustrated by the example of Singapore pursuing long-term measures.

(2) Aging

According to estimates and projections made by the U.S. Bureau of the Census in 2001, the aged population (aged 65 and above) in the world increased from some 130 million in 1950 to some 420 million in 2000. The percentage in the world population went up from 4% to 6.9% during the same period. Although the increase of this age

group is expected to be relatively modest in developed countries between 2000 and 2030, Singapore projects it to jump by 3.72 times and Malaysia by 2.77 times. Other countries in East Asia and Southeast Asia are also expected to see a dramatic increase. It is certain that the 21st century will face the aging of population on a global scale, especially in Asia, where rapid demographic transition took place. The aging of Asian countries is expected to accelerate in years to come, as the generation with a large population size, who contributed to “demographic bonus,” will start turning 65 years of age.

Table 12 shows changes in the percentage of aged population in East Asia and Southeast Asia between 1950 and 2050, based mainly on estimates and projections made by the UN Population Division. Although Japan had the second highest percentage of aged population after Malaysia in 1950, it was still below 5%. Malaysia saw the proportion of aged population decline at one stage. In contrast, the percentage of aged population has continued to rise in Japan and the country is expected to have the highest proportion of aged population even in 2050, as well as in 2000. The aged population accounted for more than 10% of the total population only in Japan and Hong Kong in 2000. But South Korea and Taiwan are projected to follow suit by 2010, while Macao and Singapore will likely do so by 2015. China is expected to join this group by 2020, to be followed by North Korea and Thailand by 2025, Malaysia by 2030, Mongolia, Brunei, Indonesia and Myanmar by 2035, and the Philippines by 2040 and East Timor by 2050. Japan, NIEs and Macao are projected to become a hyper-aged society in 2050, with the aged population exceeding some 30% of the total. These countries, as well as China and Thailand, will likely plunge into situations contrary to “demographic bonus.” Other countries are also expected to undergo similar situations, albeit less drastically. It is increasingly necessary for governments to gear themselves up and establish a social security system covering nursing care and pension.

(3) Trends in dependency burden

Table 13 shows changes in dependency ratios in East Asia and Southeast Asia between 1950 and 2050, based mainly on the estimates and projections made by the UN Population Division. Dependency ratio is the sum of child population (0-14) and aged

population (65+) divided by working-age (15-64) population and, then, multiplied by 100. The ratio roughly refers to dependency burden as the ratio of dependents to supporters. Most countries (regions) have seen the dependency ratio rise, fall (during the time of “demographic bonus”) and rise in the last 100 years. In Japan, where population transition had already started, the first rising cycle was already over. Cambodia, where the population structure was warped due to the civil war, saw the ratio rise above 100 in the mid-1990s before it started to fall again. The country is expected to benefit from “demographic bonus” only towards 2050. Dependency ratio will unlikely drop below 40 in many countries, including Japan. But NIEs, Macao and China are expected to see the ratio fall below 40 from the end of the last century till the beginning of this century, an indication that these countries are enjoying a large “demographic bonus.”

Many argue that the aging of a society increases potential dependency burden and adversely affects the economy through a falling saving rate and other factors, as seen above. However, recent empirical studies have shown results to the contrary. Bloom and Williamson (1997) conducted a multiple regression analysis on per-capita GDP growth rate of 78 countries between 1965 and 1990. They found that the longer a country’s life expectancy at birth was in 1960, the higher its economic growth rate. Life expectancy at birth is a summary measure of death rates at all ages and therefore should be seen as an index of factors that bring about the aging of population, rather than an index of aging itself. It shows that the decline in death rates across the entire population, including aged population, contributes to economic growth. In an expanded model, Bloom and Williamson studied the impact on economic growth of growth rates of child population and aged population, as well as working-age population. They found that the increase in working-age population has a positive effect on economic growth and the increase in aged population also has a similar effect, although the finding on the latter is not statistically significant. In contrast, the growing child population is found to adversely affect economic growth. Elderly people may look after small children, work part-time or continue to save in some cases. Bloom and Williamson believe this is why the increase in aged population does not constitute pure dependency burden, unlike the increase in child population, who neither works nor saves. In addition, they argue that with a lower

percentage of aged population on average, Asia is overwhelmingly affected by the increase in child population among all dependents. In fact, Bloom, Canning and Graham (2002) attributed a steep increase in saving rates in East Asia in 1950-1990 to longer life expectancy at birth and the shrinking child population on the basis of their empirical analysis. As for the Philippines, Navaneetham (2002) demonstrated that the proportion of aged population has a significant and positive effect on economic growth.

4. Changes in socio-economic structure

Demographic changes in East Asia and Southeast Asia, as shown above, have affected changes in the socio-economic structure in various ways. In particular, differences in the socio-economic structure are emerging between those countries which cashed in on “demographic bonus” and those which failed to do. Let us touch upon some of such differences, including poverty, income distribution and regional gap in these respects, rising educational levels and the narrowing of gender gap in education.

(1) Poverty, income distribution and their regional gap

“Demographic bonus” possibly affected income distribution across socio-economic strata. Williamson (2001) showed that the higher the percentage of the adult population aged 30-59 is in the enlarged working-age population (15-69), the lower the Gini coefficient and the more equally income is distributed around the world. “Demographic bonus” is a necessary condition for rapid economic growth and more equal income distribution and if it is optimized through appropriate public policies, as some Asian countries (regions) have done, it can promote rapid economic growth and more equal income distribution. However, if a government fails to implement appropriate social policies for the poor or poverty reduction policies despite rapid economic growth, income may be distributed more inequitably or economic growth may not be sustainable. It is certain that demographic changes have had a major impact on not only economic growth but the distribution of the fruits of prosperity in Asia and that public policies played a large part in this respect.

Table 14 show indicators of poverty and unequal income distribution in recent years and the past, based mainly on statistics compiled by the Asia Development Bank and the World Bank. Poverty indicators refer to the percentage in poverty according to each country's national poverty line and the percentage of population who live on less than 1 dollar (PPP) a day, the international standard of poverty. Indicators of unequal income distribution refer to the income ratio of highest 20% to lowest 20% and the Gini coefficient. These indicators are not available for many countries (regions). Definitions of these indicators can also be different at different points of time even in the same country. We also need to bear in mind the impact of the 1997 currency and financial crisis, as Knowles, Pernia and Racelis (1999) argued that unequal income distribution worsened in South Korea, Thailand, the Philippines, while the situation improved in Indonesia following the crisis.

NIEs, Thailand and Malaysia, the countries that took advantage of “demographic bonus” and achieved rapid economic growth, as well as China, which also belatedly benefited from it thanks to its shift to a marketized economy, had a lower level of poverty in recent years. In contrast, countries that have yet to experience “demographic bonus” or those which have yet to benefit from it due to inappropriate public policies, tend to have a higher incidence of poverty. The fact that China has had a relatively high percentage of people subsisting on less than 1 dollar a day even in recent years can be due to its foreign exchange rate. Meanwhile, income distribution is less unequal in Japan, NIEs excluding Hong Kong and former socialist countries. But its correlation with “demographic bonus” is unclear, given quite a few exceptions. As demonstrated by the empirical analysis of Williamson, it may be because the impact of the proportion of adult population aged 30-59, which partially represents “demographic bonus,” is stronger or because of the impact of social policies.

The poverty level is lower in urban areas than in rural areas, excepting Mongolia. A higher level of poverty in urban areas was observed in Mongolia in 1995 and Indonesia in 1990. In the case of Indonesia, this may be because urban areas attracted the poor before the currency and economic crisis, as urban areas benefited more from rising income levels or because poor people in urban areas who were no longer able to fend for

themselves in the aftermath of the currency crisis moved to rural areas. Indonesia is the only country that had a higher poverty level in recent years than in around 1990, a fact that points to the magnitude of negative impacts of the currency crisis on the country. Many countries saw the poverty level in urban areas rise in recent years, compared with 1990. The poverty level declined in urban areas in the Philippines, Thailand and Vietnam, as urban areas in these countries benefited more from higher income levels thanks to economic growth prior to the currency crisis.

However, comparisons of the Gini coefficient in two available years show that the indicator declined only in Thailand in the most recent year, remaining flat or rising in the other countries. This indicates that economic growth prior to the currency crisis made income distribution more equitable in Thailand. As for the income ratio of highest 20% to lowest 20%, we should bear in mind that data available was from a different set of countries. While South Korea, Indonesia, Singapore and Thailand saw the ratio decline, the ratio increased in the other countries. The Philippines had a significant rise in particular, reporting one of the worst levels together with Malaysia. The ratio continued to fall in Malaysia from the early 1970s, while it has risen again in the Philippines after falling from the early 1970s to the end of the 1980s. The country is expected to see the ratio decline when “demographic bonus” kicks in, resulting in more equitable income distribution in the future.

According to Knowles (2000), China, Thailand, Malaysia benefited from not only a higher saving rate as a result of declining dependency burden but also increased savings in the public sector following a decline in the number of children in need of education and health services. However, many countries in Asia are hampered by inefficiency in health, education and family planning services provided by their governments. Some countries are considering outsourcing these services for the poor to NGOs and private enterprises as part of decentralization. Experiences of South Korea and Taiwan show that the comprehensive policy framework based on market incentives and free trade brings about rapid economic growth, the most effective means to alleviating poverty. At the same time, it is necessary to implement policies that include appropriate investment in human capital in the field of education, health and family planning, targeting the poorest

stratum of the society, in order for benefits of economic growth to reach them. As Knowles points out, if a higher birth rate among the poor in some Southeast and South Asian countries (regions) is leading to an expansion of the poorer stratum of the society, family planning programs for the poor may contribute to not only more equal income distribution, but also sustainable economic growth through increasing “demographic bonus.”

(2) Rising educational levels and gender gap

At least part of higher levels of education in East and Southeast Asia is said to have resulted from “demographic bonus” for the government and parents, following the decline in the birth rate. Ahlburg and Jensen (2001) demonstrated, in their literature review, a close correlation between a high birth rate, low government expenditure on education per child and a low school enrollment ratio. They hinted that a lower birth rate would help raise per-child educational expenditure and educational levels. Their study covered countries with appropriate economic policies and the efficient education sector and those without either of them. Considering that East and Southeast Asia boasts more countries categorized as the former than do the other regions, the study indicated that governments in East and Southeast Asia put “demographic bonus” to efficient use and improved educational levels, thereby promoting economic growth. They also showed that “demographic bonus” at the household level arising from a lower birth rate (the falling number of children) is more prevalent in East and Southeast Asia than in other regions. Even if “demographic bonus” does not materialize as a result of a lower birth rate, a reduction in the number of unwanted children is likely to lead to increased investment in education and health per child. Furthermore, the declining birth rate increases the time parents can spend to enhance the human capital of their children, in addition to the money they can spend.

Table 15 shows changes in the gross secondary school enrollment ratio in East and Southeast Asia from 1970 to recent years, based mainly on the materials published by the UNESCO and the Asia Development Bank. The author singled out data on secondary education, as these regions have relatively high primary school enrollment ratios and

because some studies argue that secondary education plays a significant part in economic growth, as discussed below. Please note that the gross enrollment ratio exceeds 100% in some cases, as the number of students enrolled in secondary school is divided by the secondary school age population and that the secondary school age may differ between countries or at different points of time in the same country.

The gross secondary school enrollment ratio is rising in many countries (regions). Isolated cases of a falling enrollment ratio can be blamed on shift to the marketized economy or negative effects of the currency and economic crisis. Enrollment ratios also fell, when years of secondary education was extended. Mongolia, which boasted as high a ratio as Japan in 1970, saw the enrollment ratio decline due to both of the reasons above. The enrollment ratio jumped in South Korea and Taiwan by the 1980s, hovering at around 100% in recent years as in Japan. Malaysia and Thailand are close behind after a sharp rise in recent years, while the ratio in Indonesia also shot up. China and Vietnam are also enjoying a steady rise in the gross enrollment ratio, albeit less drastically than Indonesia. In contrast, Hong Kong, Brunei, the Philippines and Singapore have seen only modest growth, although the enrollment ratio was relatively high in these countries in 1970 or 1980. The ratio remains low in Cambodia, Laos and Myanmar, as these countries had a low ratio in the first place and have reported only modest increases since. The gross enrollment ratio appears to have risen at around the time when these countries (regions) experienced “demographic bonus.”

According to the World Bank (1993), higher levels of education contributed considerably to economic growth of the Asian countries that achieved rapid economic growth -- Hong Kong, Indonesia, Japan, South Korea, Malaysia, Singapore and Thailand – and the difference in the enrollment ratio between these Asian nations and Latin America accounted for 38% of the difference in economic growth rates. Contribution of the primary school enrollment ratio to economic growth ranged from 58% in Japan to 87% in Thailand, followed by material investments (35-49%) and the secondary school enrollment ratio. In Japan, the secondary school enrollment ratio made the second largest contribution at 41%, but it made only modest contributions in Indonesia, Malaysia and Thailand at less than 15%, with the NIEs placed in between.

What we have seen above is the average secondary school enrollment ratio for both boys and girls. But many countries report a changing gender gap in the school enrollment ratio. Let us go back to Table 15 and examine changes in the sex ratio of male secondary school students to female students multiplied by 100. In general, countries with a gross school enrollment ratio below 20-30% tend to have a sex ratio much larger than 100. In contrast, those countries with a gross school enrollment ratio above 70-80% tend to have a sex ratio below 100. Parents give priority to educating boys, when there are budget constraints or only low returns can be expected from educating girls. However, if one or both of these conditions are removed, investment in girls' education accelerates in line with the rising gross school enrollment ratio. Not a few countries in Southeast Asia report a sex ratio of close to 100, even though the gross enrollment ratio is still at around 40-50%. This may be explained by different values held in Southeast Asia from East Asia.

Despite deep-rooted discrimination against women in East Asia, the improvement in general educational levels in the region since the 1970s has helped to close the gender gap more than in other regions, enhancing productivity of women at home and in the market and supporting economic growth (World Bank 1993). During the stage prior to that, the gender gap over educational levels kept wages for women at low levels, thereby possibly contributing to economic growth. Greenhalgh(1985) said that the family system in Taiwan perpetuated gender inequality and gave rise to gender stratification, causing Taiwanese families to neglect education for girls. However, increased job opportunities for women from the 1930s encouraged parents to invest in girls' education, albeit less compared to boys, as parents became able to recover their investment in education mainly through remittances from working daughters. She noted that investment in girls' education was recovered through various means ranging from remittances, which were used to educate siblings, to marriage to an eligible partner. As the Taiwanese economy depended on export-oriented industries dependent on low-wage labor by women, discrimination against women continued in various areas, including opportunities for education. Investment in education became less discriminatory between the two sexes in accordance with rising income levels and the falling birth rate. Similar situations were

observed almost everywhere in East Asia.

Ahlburg and Jensen (2001) argued that later marriage extended the time period when parents were able to recover their investment in educating daughters, encouraging them to invest more in daughters' education. If so, later marriage, together with the resulting lower birth rate, may have encouraged parents to spend money on the education of their daughters and assisted economic growth. Greenhalgh (1985) suggested that the family system in Taiwan and gender inequality in terms of educational opportunities promoted economic growth there and made income distribution among households more equitable at least during the early stage. It is possible that a similar process took place in other countries (regions) in East and Southeast Asia. In any case, at the beginning of rapid economic growth, the gender gap in educational levels and discrimination against women behind it may have helped the development of export-oriented industries, which depended on low-wage labor by women. But in order to subsequently sustain economic growth, it would be necessary to invest in human capital regardless of sex and enhance productivity in the market and at home as part of efforts to tackle the rapidly aging society in Asia. At the same time, promoting gender equality and building a society for everybody to enjoy living in will be a solution to arrest the excessive decline in birth rate, which is becoming increasingly apparent in Asia including Japan and NIEs.

Conclusion

The World Bank (2002) discussed sustainable socio-economic development mainly in relation to the environment in *World Development Report 2003* entitled "Sustainable Development in a Dynamic World." The report touched upon "demographic bonus" briefly. In the final chapter, the report called on developed nations to open their labor markets to developing countries and discussed international migration that is expected to further accelerate in the future under the heading "What are the prospects for global migration?" in its final paragraph. The report argues that global inequality and the population trend around the world, namely scarce job opportunities in developing countries with a high birth rate and a shortage of unskilled labor for nursing and other

jobs in aging developed countries, will increase migration pressure. With information and transportation costs on the decrease, both demand for and supply of international migrants is expected to surge in the next 50 years. International migration is a politically sensitive issue for receiving countries, although there are reasons to support it in the short and the long run. The social integration of newcomers poses a particularly serious challenge. But stresses related to international migration result more from the speed of change than from the level of change. The report concludes that the world would be a better place in 2050 if both sending and receiving countries prepare themselves in advance for international migration over the next generation.

International migration has been escalating in East Asia and Southeast Asia in recent years and is expected to become more prevalent in future. The Philippines encourages its people to take up jobs abroad as a means of obtaining foreign currency, as the country is failing to provide enough employment opportunities at home to people who are sufficiently educated, an example of failure to cash in on its “demographic bonus.” More or less similar phenomena are now observed in other Southeast Asian countries and were seen in East Asian nations in the past. Remittances from abroad in these countries (regions) may have played a larger part in economic growth than previously believed. On the other hand, Japan and NIEs have become potentially in need of foreign workers, as the aged population is rising amid the decline in the working-age population after they took full advantage of the “demographic bonus.”

The UNFPA's (1998) report acknowledged the history of international migrants contributing to economic growth in sending countries. The report said that while “brain drain” of competent workers reduced the benefit from “demographic bonus” for sending countries, remittances from migrants would support families, communities and the national economy. It concluded that if a country succeeds in accelerating economic growth through the efficient use of “demographic bonus,” it will be able to curb migration pressure. While the report does not name a particular nation, it appears to be referring to the Philippines as a prime example of a country whose development has been hampered by brain drain. Navaneetham (2002) demonstrated that population growth had a negative impact on economic growth only in the Philippines among the original

ASEAN 5, although they had similar levels of human capital at the early stage. He attributed it to differences in the total fertility rate, the openness of trade and the quality of policy-implementing agencies. On the other hand, the Philippines may well achieve sustainable economic growth through appropriate public policies, as its “demographic bonus,” which until now has been small due to the country’s high birth rate, is expected to increase as a result of the falling birth rate in recent years.

Japan and NIEs have been easing migration pressure by carrying out direct investments in East and Southeast Asia and hiring local workers, instead of opening the door to migrant workers. However, the outbreak of SARS in 2003, which highlighted the risk inherent in conducting business abroad, may persuade businesses to diversify countries of operation or partially resume domestic production. This could in turn affect the level and directions of international migration. International migrants comprise not only workers and their families but also those who migrate through marriage. As shown by cases in Japan and Taiwan, a growing number of men marry women from neighboring countries, a practice that is contributing to the population reproduction of a country (region) in question and demographic integration with neighboring nations. In short, international migration is a means of redressing an international imbalance in income levels and population structure and is growing in tandem with economic globalization.

Escalation of international migration due to economic globalization has worsened the spread of HIV/AIDS and more recently the spread of SARS. Both cases highlighted the importance of prompt measures, preventive measures in particular, and show that delayed response by one country could result in the spread not only in neighboring countries but across the world. The incidents made people realize that demographic integration within Asia or demographic globalization was also under way in morbidity. They also demonstrated that the outbreak of a disease negatively affects economic growth. Death of working-age people from HIV/AIDS means that investment in their human capital will come to waste and their children may not receive necessary investment in the development of their human capital. An Asian Development Bank report (Fan 2003) estimated if the SARS epidemic lasted for a quarter, East Asia would incur 9.1 billion dollars in economic losses and Southeast Asia 3.2 billion dollars. If we include long-term

losses and indirect impacts, the total damage is expected to be huge. On the other hand, economic globalization has helped disseminate health care and family planning techniques. One should also keep in mind that economic globalization has played a major part in improving educational levels and promoting gender equality.

In summary, now that the importance of demographic factors, including health, and the state of demographic globalization have been demonstrated in relation to sustainable economic growth, we realize that governments in Asia and beyond should join forces and international organizations need to implement appropriate public policies at an opportune time. Human reproduction is a process taking place on a global scale and developed countries are benefiting from the brain drain of developing countries at the expense of the latter. It is perhaps about the time we should come up with comprehensive population and family policies on a global scale beyond frameworks for specific groups in order to keep abreast of globalization, as Folbre (1994) suggested.

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