Demographic Change and Human Resources Development in Asia and the Pacific: An Overall View

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NUPRI Research Paper Series No. 40

March 1988

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C O N T E N T S

T A B L E S

F I G U R E S

A B S T R A C T

During the past two decades or so, many Asian-Pacific Rim countries have experienced remarkable economic growth. Although there is no consensus concerning how economic growth occurs, this is thought to be related, in one way or another, to the success these countries have made in their demographic changes and human resources development. In this paper, we first examine the recent levels and trends of demographic factors such as fertility, life expectancy, and infant mortality among countries at different stages of economic development in the Asian and Pacific region, by heavily drawing upon the macro-level data published by the World Bank and the United Nations.

We then analyze inter-temporal changes of interrelations between these demographic factors and variables of human resources development such as education, female labor force participation, and proportion of agricultural labor force. The analysis found that secondary education and changes in proportion of agricultural labor force are integrally related to economic development in the region. After analyzing the principal sources of recent economic growth in the region, we next consider the differences in the role of human resources in postwar economic development among the three sub-regions in Asia: East Asia, Southeast Asia, and South Asia. Finally, some of the newly-emerging issues on human resources development in the region as a whole are discussed.

This is a product of the research undertaken as a part of the Nihon University President's Commissioned Project entitled, "Sources of Economic Dynamism in the Asian and Pacific Region: A Human Resource Approach." The paper was presented at the Project's first meeting held on January 8-10, 1988, at Nihon University Population Research Institute, Tokyo, Japan.

I. Introduction

In the past two decades or so, a number of the Asian-Pacific Rim countries have achieved new prominence in economic growth performance. Since 1960, the market economies of East Asia have been growing at average annual rates of 6 percent or more on the basis of per capita income. Only slightly lower economic growth rates have been recorded by China and some of the Southeast Asian countries during the corresponding period. These levels of growth performance are considerably higher than for any other region of the world. In 1960, the share of the world GNP for the East Asia-Pacific region was only 11 percent. One of the recent estimates shows, however, that if the present and foreseeable economic trends continue, this share will double by the year 2000, thus being comparable to that of the Western European countries or the North American region (Economic Planning Agency, 1983).

Although there has been no consensus among development economists on definite answers to the question of how economic growth occurs, such remarkable economic growth in various parts of the Asian and Pacific region seems to be attributable to the following factors:(1) substantial investment in public and private infrastructure induced by a high rate of savings and effective means of allocating savings to productive investment; (2) an efficient use of advanced technology imported from industrialized countries; (3) a stable political climate, and (4) availability of better educated and trained human resources, and (5) an export-oriented development strategy in an era of favorable international trading environment (East-West Center, 1988). It is important to note, however, that there are substantial inter-country differences in terms of the importance of these factors in the East and Southeast Asian economic success stories.

More importantly, most of these factors are closely linked to population change. In recent years, the Asia-Pacific region has been undergoing rapid demographic change in parallel with its dramatic economic growth. For instance, the annual rate of population growth for East Asia declined from 1.98 percent during 1960-1965 to 1.21 percent over the period 1980-1985 (United Nations, 1986). Over the same time period, the population growth rate for Southeast Asia dropped from 2.38 to 2.05 percent. Although mortality improved remarkably

in these regions during the period in question, fertility reduction was even more pronounced, consequently leading to such lower population growth rates.

In the process of slowing population growth, the labor force continues to grow some years after fertility declines, thus increasing the percentage of the population in productive activities. Moreover, as a result of reduced fertility, more economic resources can be allocated to those in the labor force in order to equip them with better physical capital. In addition, increased economic resources facilitate improvements not only in the coverage of the education program but also its quality. A number of the countries in the Pacific Basin are now at a later stage of the demographic transition in which these economic advantages have been well appreciated. Newly industrialized countries such as the Republic of Korea (called South Korea hereafter), Singapore, Hong Kong, and Taiwan are salient examples. Besides these Asian NICs, developed countries in the Pacific Rim have also enjoyed high quality human resources in their developmental processes. In the case of Japan, for instance, the college-level enrollment rate increased from 10.1 to 37.6 percent over the period 1960-1985 (Ministry of Education, 1987). This rapid increase in the enrollment rate for higher education has contributed to widening and strengthening the base of human resources which, in turn, has facilitated the adaptation of advanced technologies borrowed from the Western world in her postwar economic development.

It is interesting to note that what is common among all of the economically successful countries in the East-Asia and Pacific region is that they are deficient in natural resources but rich in human resources. In contrast to these successful countries, other developing countries in the western part of the Pacific Basin have been slow in improving the quality of their human resources.

In the present paper, we discuss: (1) intertemporal changes in the interrelationships between demographic factors and human resources development in the Asia and Pacific region, using inter-country macro-level data; and (2) the comparative role of human resources in postwar economic growth in some of the countries in the region. In the next section, the recent levels and trends of demographic factors are compared among various countries at different stages of economic development in Asia and the Pacific, by heavily drawing upon macro-

level data published by the World Bank and the United Nations. In Section III, the principal sources of recent economic growth are considered from a standpoint of socio-demographic development with special emphasis upon education and labor force. Section IV discusses the differences in the role of human resources in postwar economic development among the three sub-regions in Asia. Then, some of the newly-emerging issues on human resources development in Asia are considered in the final section of this paper.

II. Demographic Trends and Patterns in the Asian and Pacific Region

Demographic changes are aspects of the total process of social change. The course and speed of demographic transition are associated intimately with social, economic and cultural institutions of society. It is a familiar theme in population studies that economic development is, in general, inversely related to the levels of fertility and mortality. This generalization is based to a large extent on Western experience. In broad historical perspective, when mortality and then fertility declined in many European countries during the 19th and the early 20th centuries, there was an associated increase in material well being (Weinstein, 1976: 104). The "classical" model of demographic transition thus postulated that as society modernizes and develops economically, mortality and fertility eventually decline, However, close examination of various European populations reveals little statistical evidence of an association between mortality and fertility declines or a specific level of socioeconomic development (van de Walle and Knodel, 1967, 1980). Especially, the onset and spread of fertility decline could not be explained by any simple, universally applicable model or general description, although fertility reduction appeared to be a nearly universal characteristic in the emergence of modern secular societies (Coale, 1969).

Studies on non-Western (especially Asian) populations pose further questions concerning the significance of socioeconomic development as a prerequisite for demographic transition as well as about the level of development associated with the onset of the decline. Mortality reduction in many developing countries was brought about mainly by importation of medical technology and public hygiene

from Western developed countries, and the mortality decline was, unlike their Western predecessors, often not followed by fertility decline. Moreover, evidence from studies of many Asian countries indicates that relatively small subsets of developmental changes are enough to bring down fertility (Knodel and Debavalya, 1978; Sun et al., 1978) and that a deliberately organized social effort to control fertility, which can be independent of development, can have a significant influence on fertility reduction (Freedman and Takeshita, 1969; Knodel et al., 1980; Hogan and Frenzen, 1981; Donaldson et al., 1982).

In this section, we look in detail at trends and patterns of changing fertility and mortality in Asia and the Pacific, dividing the region into four subregions: East Asia, Southeast Asia, South Asia, and the Pacific (mainly Oceania). In the next section, we then examine the interrelations between demographic changes and socioeconomic variables, we seek to assess whether there is any evidence of demographic impacts on economic development, and whether and how much human resources development contributed to economic development.

a. Index of demographic transition in Asia and the Pacific: an overall view

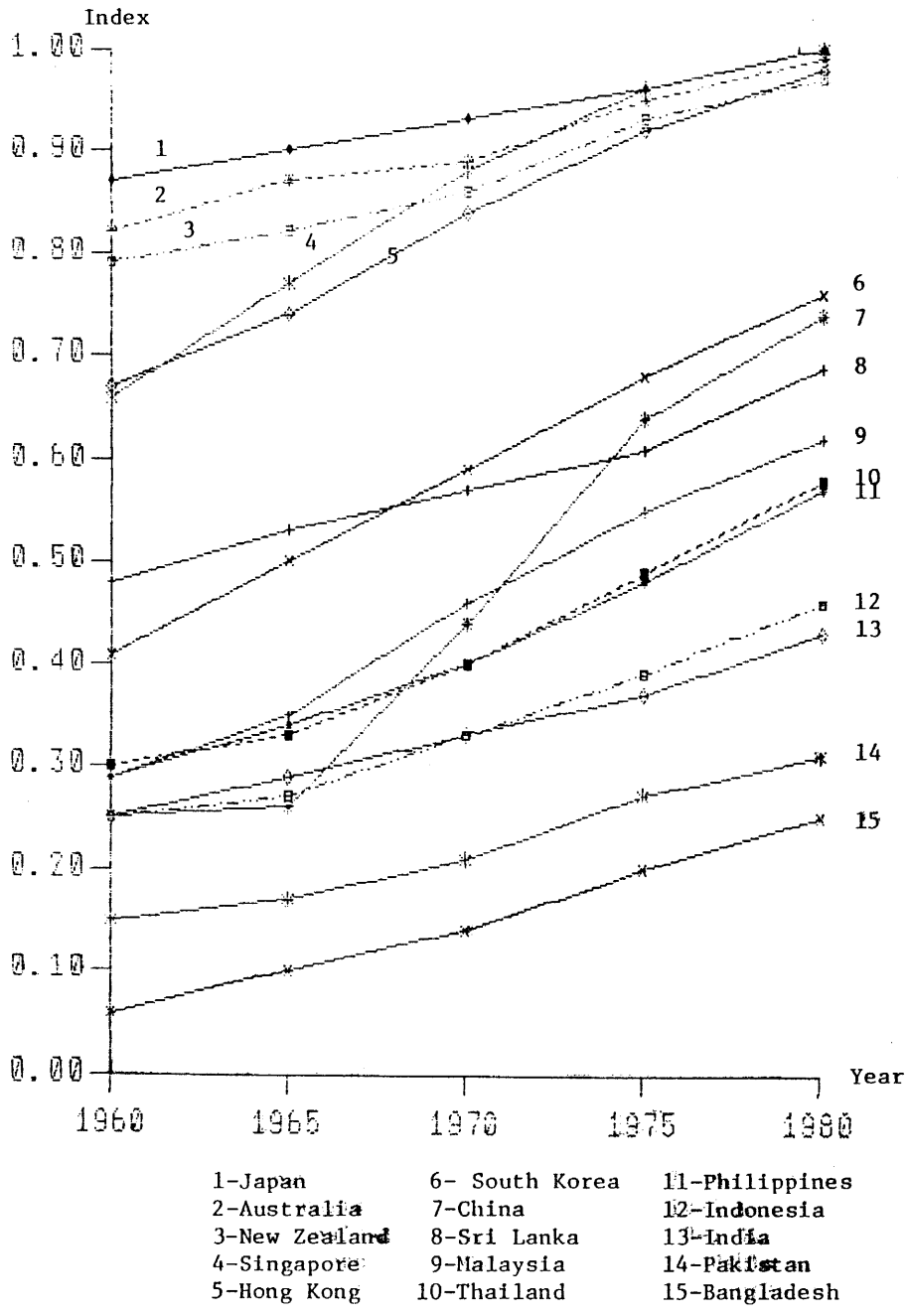
Demographic transition is a multi-dimensional process, involving changes in many demographic variables such as fertility, mortality and migration. A major characteristic of demographic transition in Asia is said to be its quickness, compared with experiences of Western countries (Cho and Tagashi, 1984). However, there also appears to be significant sub-regional differences in demographic transition. We first constructed a rough index of the transition process for selected countries in the four sub-regions to show the degree of the demographic transition completed.[1/] This index is by no means a perfect indicator of the degree of demographic transition, but nevertheless provides useful and concise information on the degree. Table 1 and Figure 1 show changes in this index for the Asian-Pacific countries under consideration during the period 1960-80. From the table and the figure, we can see that: (1) Japan and such NICs as Hong Kong and Singapore, together with Australia and New Zealand completed their demographic transition by 1980 wit the highest values of the index among the countries under consideration. Especially, the rapid tran-

Table 1. Index of Demographic Transition: Selected Countries in Asia and the Pacific, 1960-1980

Country	1960	1965	1970	1975	1980
1. Japan	0.87	0.90	0.93	0.96	1.00
2. Australia	0.82	0.87	0.89	0.95	0.99
3. New Zealand	0.79	0.82	0.86	0.93	0.97
4. Singapore	0.66	0.77	0.88	0.96	1.00
5. Hong Kong	0.67	0.74	0.84	0.92	0.98
6. South Korea	0.41	0.50	0.59	0.68	0.76
7. China	0.25	0.26	0.44	0.64	0.74
8. Sri Lanka	0.48	0.53	0.57	0.61	0.69
9. Malaysia	0.29	0.35	0.46	0.55	0.62
10. Thailand	0.30	0.33	0.40	0.49	0.58
11. Philippines	0.29	0.34	0.40	0.48	0.57
12. Indonesia	0.25	0.27	0.33	0.39	0.46
13. India	0.25	0.29	0.33	0.37	0.43
14. Pakistan	0.15	0.17	0.21	0.27	0.31
15. Bangladesh	0.06	0.10	0.14	0.20	0.25

Sources: United Nations, Demographic Yearbook, Various Years; World Bank (1983), World Tables, 3rd Edition Volume II: Social Data. Baltimore: Johns Hopkins University Press.

Figure 1. Index of Demographic Transition: Selected Countries in Asia and the Pacific, 1960-1980



sition achieved by Singapore during 1960-1975 was noticeable. (2) Countries that achieved the intermediate level of completion (0.5-0.8) by 1980 are the remaining two East Asian countries (South Korea and China), Sri Lanka and all the other ASEAN countries except for Indonesia. Among them, the accomplishment made by the two East Asian countries is impressive, the speed of the Chinese transition between 1965-1975 being especially remarkable. (3) The degree of transition in Indonesia and all the South Asian countries except for Sri Lanka was still relatively low in 1980 and the tempo of the transition was in general relatively slow. In fact, although Indonesia and India had a level of transition comparable to that of China during the early 1960s, the difference between them became increasingly larger over the next fifteen years.

Based on these findings, it is therefore possible to group and rank the level of completion of demographic transition by sub-region, although there are some exceptions. Specifically, East Asia, led by Japan, achieved the highest level of transition by 1980, followed by Southeast Asia, and then by South Asia. In the following two subsections, we will look in detail at changes in two major components of demographic transition, namely fertility and mortality.

b. Fertility changes by sub-region

The success in fertility reduction by East Asian countries, and more recently by many ASEAN countries, has received considerable research and policy attention. Since it is clear that there are substantial inter- as well as intra-regional variations in trends of changing fertility, we examine in detail fertility changes during 1950-1980 by sub-region. Figures 2A-2D show changes in the crude birth rate (CBR) for the four sub-regions.[2/] From Figure 2A, we can see that in East Asia, the region known for its demographic success, Japan is the forerunner of fertility transition, with its birth rate starting to decline immediately after World War II and being cut by one half in only a decade (1947-1957). The other countries have followed pretty much the pattern set by Japan. Hong Kong and China have succeeded in halving their birth rate in approximately ten years although at different time periods (1961-71 in Hong Kong, and 1969-79 in China). The tempo of fertility reduction in South Korea was

Figure 2A. Crude Birth Rates: Selected Countries in East Asia, 1950-1980

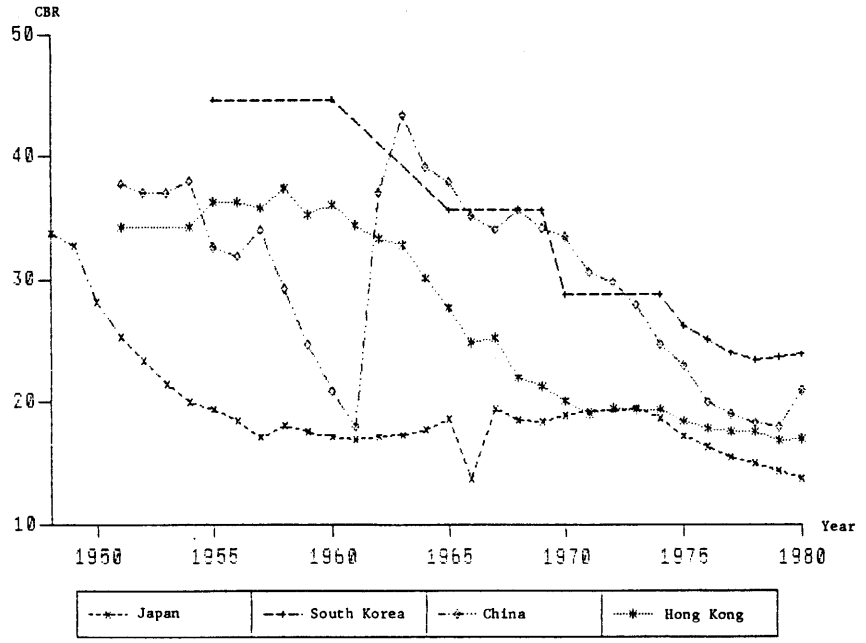


Figure 2B. Crude Birth Rates: Selected Countries in Southeast Asia, 1950-1980

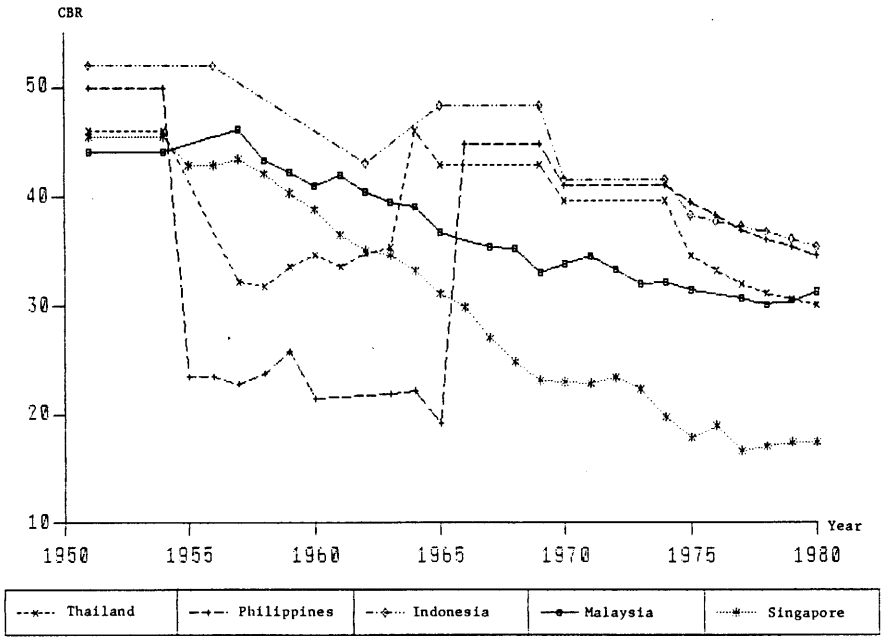


Figure 2C. Crude Birth Rates: Selected Countries in South Asia, 1950-1980

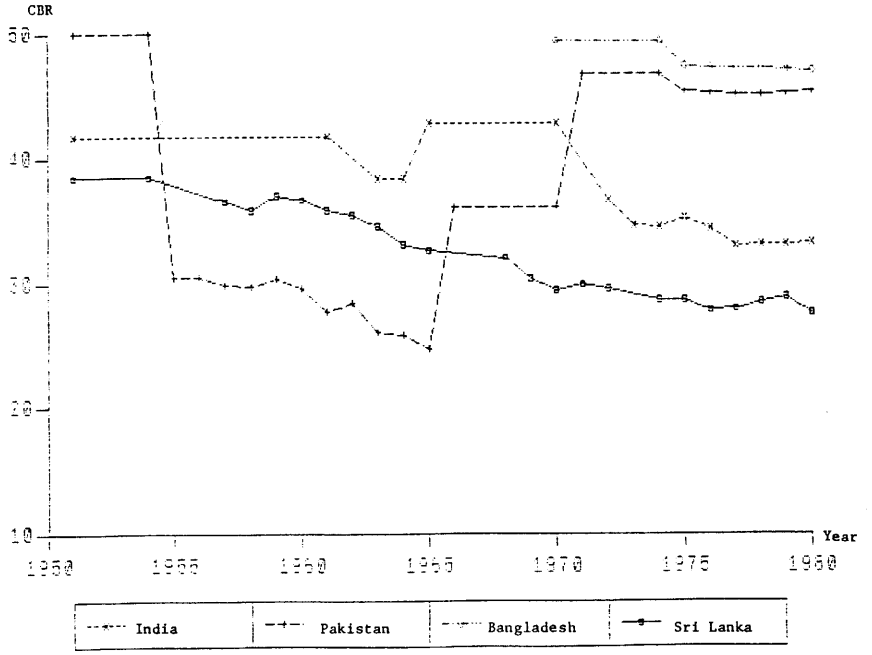
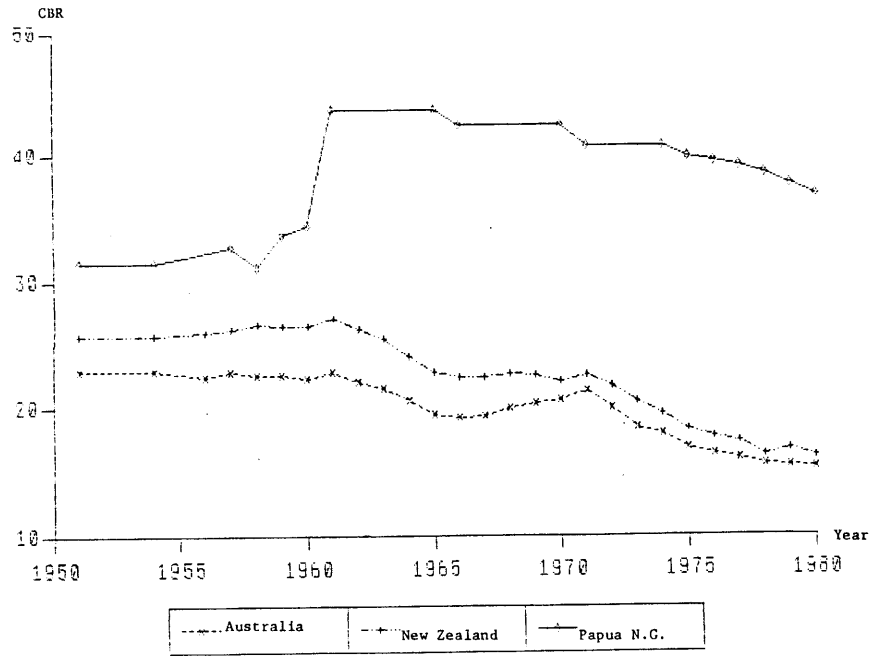


Figure 2D. Crude Birth Rates: Selected Countries in the Pacific, 1950-1980



slower, but nevertheless their birth rate was cut by one half in 15 years from 1962-1977. Concerning China, although it appears to show in Table 2A a somewhat different pattern of fertility change, it is due mainly to large fluctuations before 1970 caused first by the Great Leap Forward (which is now called in China the "Period of Hardships") and then by the beginning of Cultural Revolution. After the late 1960s, China's birth rate took a sharp downturn, with a pace similar to that of Japan immediately after the war. This dramatic decline is thought to be due primarily to the strong government effort to control population growth through a series of family planning campaigns such as the wan xi shao (later-fewer-longer) family planning campaign starting in 1972 and the famous one-child family campaign starting in 1979 (Bongaarts and Greenhalgh, 1985; Chen, 1979).

From changes in the CBR in Southeast Asia (see Figure 2B) we can find that while all the ASEAN countries under consideration experienced considerable fertility reduction during 1970-1980, they show substantial differences in the trends of fertility during the period prior to 1970. Specifically, like many East Asian countries, Singapore is a showcase of success, cutting its fertility by one half in one decade between 1965-1975. Malaysia experienced a gradual but steady fertility decline whereas the other three ASEAN countries went through a period of decline and then rebound. The degree of this fluctuation is especially dramatic in the Philippines which achieved the lowest fertility level in the sub-region during the late 1950s and the early 1960s, and then had an enormous upturn in its birth rate in the mid-1960s, bringing its fertility to a level similar to Indonesia that has recorded the highest fertility in the region.

Concerning changes in the CBR in South Asia, we can see from Figure 2C that except for Sri Lanka, whose fertility rate shows a trend of gradual but steady decline, fertility in all the other countries (India, Pakistan, Bangladesh) show no clear sign of the onset of fertility transition. Since the annual statistics for these three countries are unavailable and their data quality is often poor (United Nations, 1985a: 37), we cannot draw any definite conclusion on the detailed pattern of fertility change in South Asia. However, it seems indisputable that, except for Sri Lanka, their fertility has not yet reached the onset of fertility transition.

Turning finally to CBR changes in countries in the Pacific, we

can see from Figure 2D that except for Papua New Guinea (whose data quality before the early 1960s is doubtful) the fertility level of the two remaining countries (Australia and New Zealand) was relatively low already in 1950 with CBR being approximately 25, and that the tempo of decline since the early 1960s was gradual.

c. Mortality changes by sub-region

In a process of demographic transition, mortality decline usually takes place before fertility reduction. The reduction in mortality has generally been rapid in Asia and the Pacific owing mainly to the spread of modern public health and medical technologies throughout the region since World War II. However, like fertility, there are also considerable differences in levels and trends of mortality changes within and among the four sub-regions. In this subsection, we examine changes in mortality by sub-region, as reflected in three indicators: crude death rate (CDR), life expectancy at birth, and infant mortality rate.

1. Crude death rate

Figures 3A-3D depict changes in the death rate per 1,000 population (CDR) for the four subregions during 1950-1980. From Figure 3A, we can see that mortality transition had already been completed by the early 1960s among two East Asian countries (Japan and Hong Kong) which are considered to have almost completed their demographic transition by 1980. South Korea and China have gone through a process of rapid mortality reduction during the three postwar decade, reaching the level similar to that of Japan and Hong Kong by 1980, though China experienced an abrupt upswing in its mortality during the short period of the Great Leap Forward famine (1959-1961).

Concerning changes in the CDR among Southeast Asian countries, we see some variations within the sub-region: (1) Like such successful East-Asian countries as Japan and Hong Kong, Singapore had completed its mortality transition by 1960 (in fact, there is almost no difference in mortality patterns between two city-state countries, Hong Kong and Singapore). (2) Indonesia has been substantially behind in mortality reduction, with the CDR being distinctively higher than the

Figure 3A. Crude Death Rates: Selected Countries in East Asia, 1950-1980

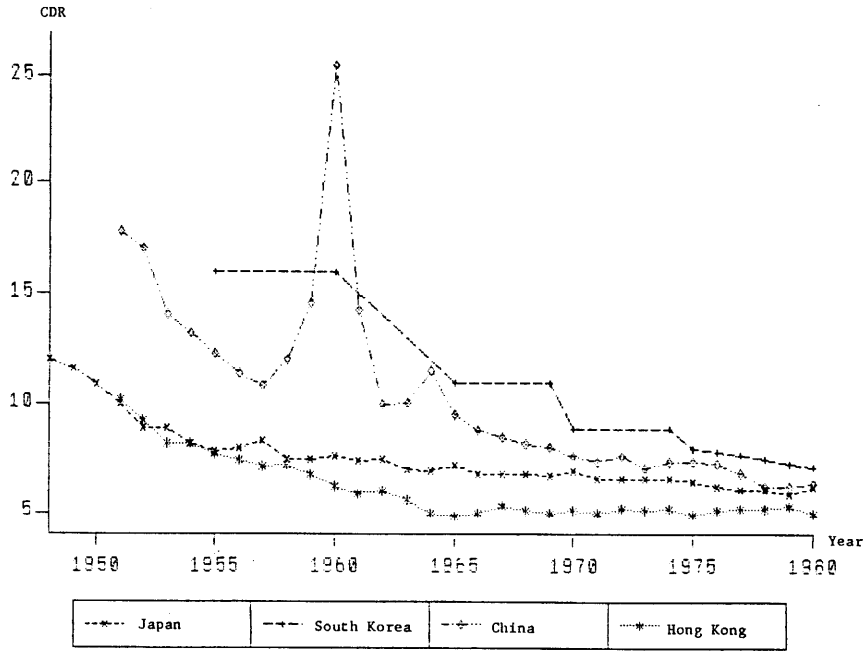


Figure 3B. Crude Death Rates: Selected Countries in Southeast Asia, 1950-1980

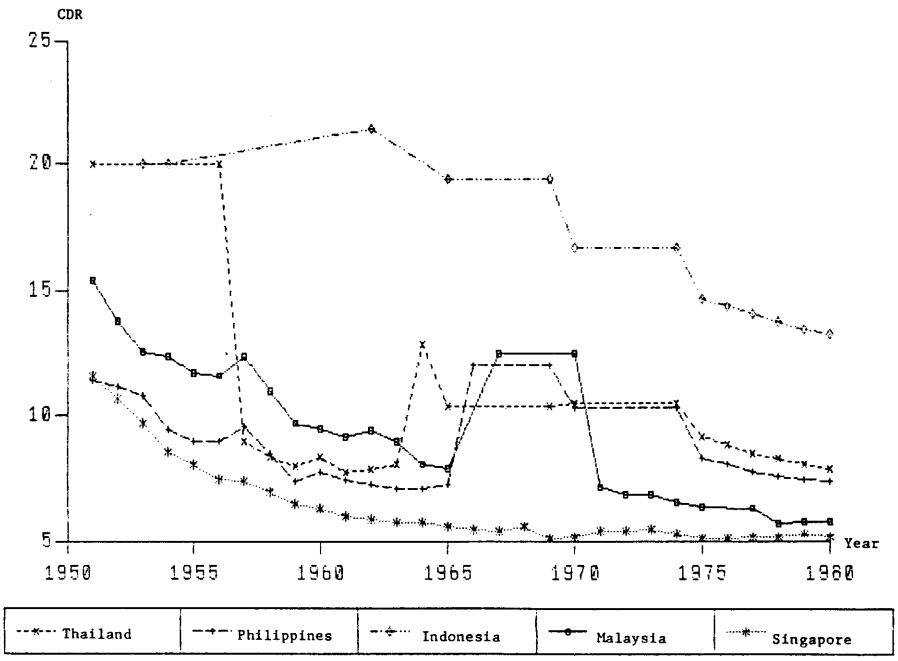


Figure 3C. Crude Death Rates: Selected Countries in South Asia, 1950-1980

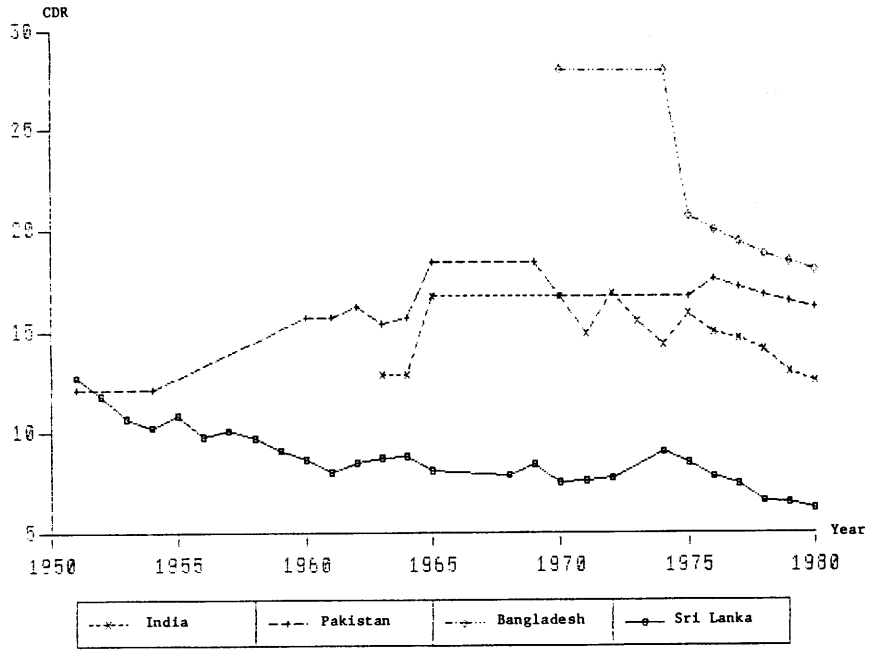
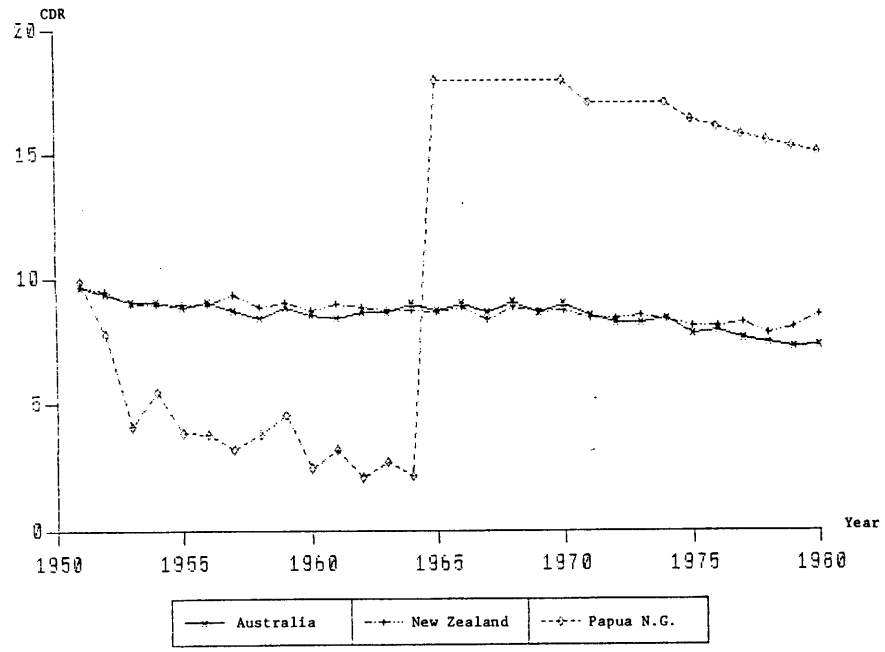


Figure 3D. Crude Death Rates: Selected Countries in the Pacific, 1950-1980



ASEAN countries throughout the period under consideration. (3) Mortality of the remaining three countries (Thailand, Philippines, and Malaysia) has been in general decline, with some fluctuations due probably to unavailability of annual data during certain sub-periods and/or to their questionable quality. It is also noticeable that after 1970 Malaysia has virtually completed its mortality transition, reaching the level similar to those of Japan and China in 1980.

Moving next to South Asia, we can see from Figure 3C that Sri Lanka is again an "honor student" in mortality reduction in this sub-region, with its CDR gradually declining and reaching to the level comparable to Malaysia by 1980. In contrast, mortality in all the other South Asian countries has not yet shown a clear sign of transition although their CDRs declined somewhat during 1975-1980.

Turning to mortality changes in the Pacific, Figure 3D shows that the two developed countries in the region (Australia and New Zealand) have sustained almost parallel levels throughout the period under consideration, with the CDR being around 10. Concerning Papua New Guinea, the abrupt jump in its CDR in the mid-1960s is owing to the difference in data quality: the rates prior to 1965 were computed by the country itself utilizing data of unreliable quality, while the figures in 1965 and later are the estimates by the United Nations. We therefore consider that the picture after 1964 is the one closer to reality. According to those estimates, the mortality level of Papua New Guinea during 1965-1980 was similar to those of such South Asian countries as India and Pakistan.

2. Life expectancy at birth

Life expectancy is derived through construction of life tables that, generated from age-specific mortality rates, essentially combine mortality rates of a population at different ages into a single statistical model. In this sense, life expectancy is often a better measure of mortality levels than CDR, especially for comparisons among different populations, since life expectancy does not reflect the effects of variations in their age structure.

Table 2 documents an overall trend of increasing life expectancy at birth in the Asian-Pacific region during 1960-1980. However, we also find considerable differences in the level and the tempo of

Table 2. Life Expectancy at Birth: Selected Countries in Asia and the Pacific, 1960-1980

Country	1960	1965	1970	1975	1980
EAST ASIA					
Japan	68.0	70.3	72.4	74.5	76.4
South Korea	54.4	57.3	60.3	62.8	65.4
China	40.5	48.5	57.9	62.5	66.4
Hong Kong	66.7	68.9	70.9	72.6	74.5
SOUTHEAST ASIA					
Singapore	64.5	66.9	68.7	70.2	71.5
Thailand	52.3	55.4	57.9	60.2	62.6
Philippines	52.8	56.0	59.0	61.1	62.8
Indonesia	41.2	43.8	47.3	50.7	53.1
Malaysia	53.0	55.5	59.0	62.3	64.3
SOUTH ASIA					
India	43.2	45.9	48.1	49.9	51.8
Pakistan	43.3	45.4	46.2	47.7	49.8
Bangladesh	37.3	40.1	41.6	44.0	47.4
Sri Lanka	62.0	63.9	63.6	64.3	68.3
PACIFIC					
Australia	70.9	71.6	72.1	72.6	74.0
New Zealand	71.7	71.8	71.8	72.4	73.7
Papua New Guinea	40.6	43.9	46.4	49.0	50.6

Sources: The same as Table 1.

increases between as well as within sub-regions, and Figures 4A-4D clearly depicts these differences. From Figure 4A, we can see that the tempo of increases in life expectancy has been very similar for all the East Asian countries considered except for China. Note that although the tempo and the degree of absolute gains are similar, there remain some, though not large, differentials between South Korea and the other two countries (Japan and Hong Kong). From Figure 4A, we also can instantly see the rapidity of life expectancy increases in China, gaining more than 20 years in two decades between 1960-1980, and catching up with South Korea by 1980. In addition, as we will later see in this subsection, Japan's life expectancy kept growing during 1950-1980, in contrast to life expectancy in Australia and New Zealand (two other industrialized countries considered in the region) that has almost levelled off. Consequently, Japan's life expectancy surpassed those of the two Oceanian countries by 1970, the difference being more than two years in 1980 (76.4 for Japan and around 74.0 for Australia and New Zealand).

Concerning Southeast Asia, Figure 4B shows upward trends in life expectancy at birth during 1960-1980. Moreover, although the tempo of increases and the degree of absolute gains are similar, inter-country differentials remain large. Specifically, Singapore again is the forerunner with the level close to that of Japan, a country with one of the world highest life expectancy. Thailand, the Philippines and Malaysia have experienced mortality reduction with similar tempo and levels, with a lag of approximately 10 years behind Singapore. Indonesia again is the last runner in mortality transition, approximately 10 years behind that of the above three countries.

Turning to South Asia, we can again see that Sri Lanka has recorded a level of life expectancy much higher than the remaining three countries, and almost comparable to that of Singapore. On the other hand, life expectancy of the remaining three countries has been low, the level being around 45 years in 1980, indicating the necessity of more effective implementation of public health measures and better utilization of medical services, in addition to the general improvement in the standard of living (See Figure 4C).

Lastly, among selected countries in the Pacific presented in Figure 4D, Australia and New Zealand have almost identical trends and levels of life expectancy throughout the period under consideration.

Though their life expectancy, like many Western industrialized countries, has been at a very high level, it did not make much of an absolute gain during the three decades, thus distinguishing these two countries from patterns of East Asian countries. The level and tempo of life expectancy increases in Papua New Guinea are very similar to those of such South Asian countries as India and Pakistan.

In summary, we then can conclude that patterns and the tempo of changes in life expectancy generally coincide with a picture of CDR changes found in the previous subsection.

3. Infant mortality rate

In the previous subsection we found the increasing trend in life expectancy among countries in Asia and the Pacific. Generally speaking, when a population experiences mortality transition and has substantial life expectancy gains, it is due mostly to rapid decline in infant mortality. In this sense, we can consider that infant mortality changes are the most influential component of life expectancy changes. Table 3 presents the infant mortality rates per 1,000 live births for the Asian-Pacific countries under consideration between 1960-1980, and Figures 5A-5D show changes in the rate by the four sub-regions. As we found in the sub-section on life expectancy at birth, we can see from patterns and levels of infant mortality changes shown in the table and the figures that the life expectancy changes (mainly gains) do indeed reflect decreases in infant mortality.

Among the East Asian countries considered, Japan is the front runner of infant mortality reduction, with her rate being already low (around 30 per 1,000 live births) in 1960 and declining rapidly during 1960-1965 and then gradually thereafter (see Figure 5A). Hong Kong followed Japan closely, with their differences narrowing during the 1970s. The tempo of infant mortality reduction in South Korea is similar to those in Japan and Hong Kong; however, the difference between these two forerunners and South Korea remains considerable. China experienced a rapid infant mortality reduction during 1960-1970, and then the reduction slowed down abruptly during the 1970s, owing probably to the Cultural Revolution. Consequently, China's infant mortality was still twice as high as that of South Korea's in 1980.

Figure 4A. Life Expectancy at Birth (e_0): Selected Countries in East Asia, 1950-1980

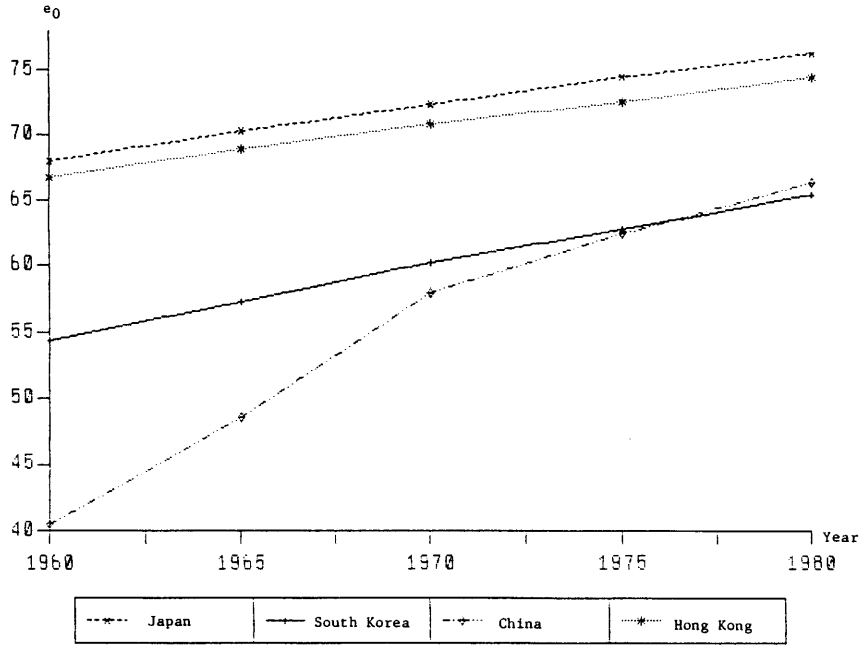


Figure 4B. Life Expectancy at Birth: Selected Countries in Southeast Asia, 1950-1980

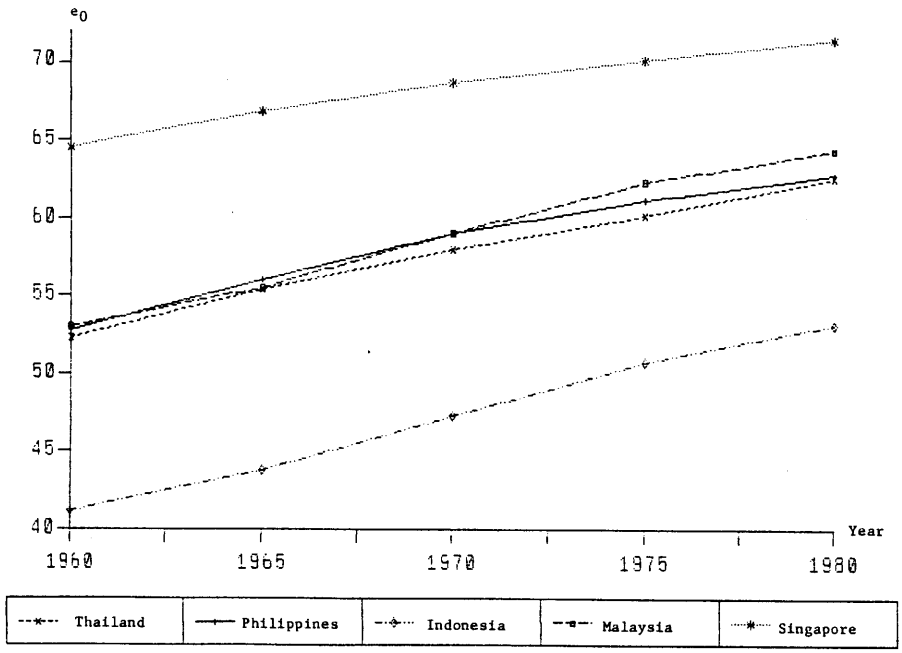


Figure 4C. Life Expectancy at Birth: Selected Countries in South Asia, 1950-1980

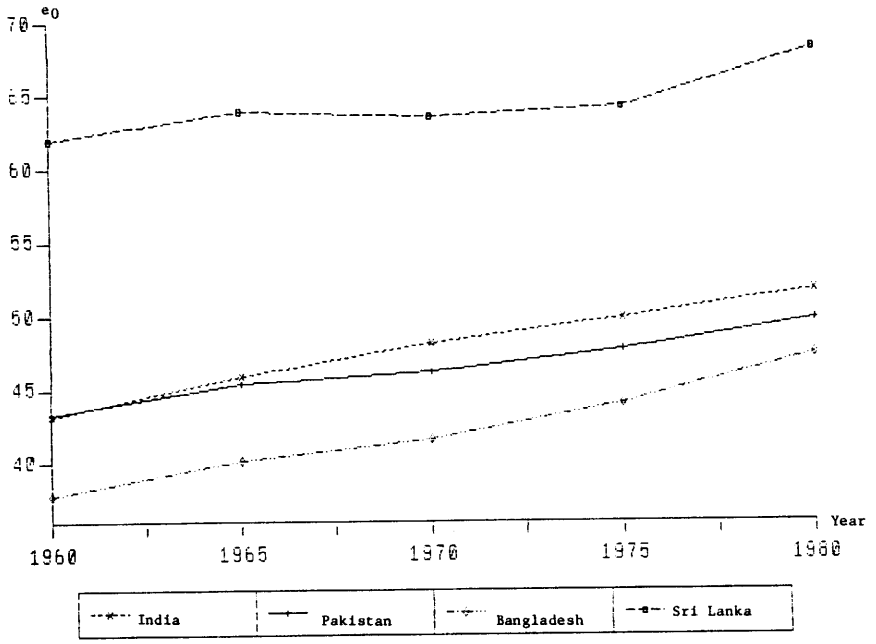


Figure 4D. Life Expectancy at Birth: Selected Countries in the Pacific, 1950-1980

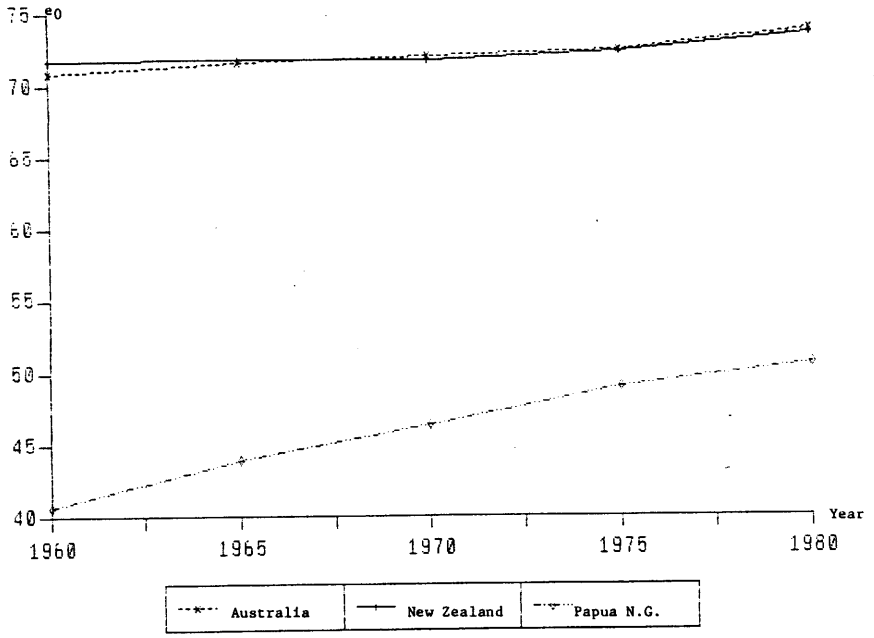


Table 3. Infant Mortality Rate Per 1,000 Live Births: Selected Countries in Asia and the Pacific, 1960-1980

Country	1960	1965	1970	1975	1980
EAST ASIA					
Japan	30.4	18.4	13.1	10.0	7.4
South Korea	78.3	64.2	50.1	39.7	34.1
China	165.0	125.0	90.0	88.0	72.0
Hong Kong	36.7	28.2	21.0	14.9	9.8
SOUTHEAST ASIA					
Singapore	35.7	26.9	21.3	15.7	11.8
Thailand	103.0	89.5	74.6	62.1	54.8
Philippines	105.8	89.2	75.0	63.6	54.7
Indonesia	149.9	137.4	120.9	113.0	105.0
Malaysia	72.4	57.3	45.6	36.6	31.1
SOUTH ASIA					
India	165.0	151.0	139.0	131.0	123.4
Pakistan	161.5	149.5	143.0	135.6	125.5
Bangladesh	159.0	153.2	150.3	145.0	136.1
Sri Lanka	70.6	63.0	58.5	51.9	44.2
PACIFIC					
Australia	20.2	18.5	17.9	14.3	11.0
New Zealand	22.6	19.5	16.7	16.0	11.7
Papua New Guinea	165.0	147.5	133.0	118.0	104.5

Sources: The same as Table 1.

Turning to Southeast Asia, we can instantly see from Figure 5B that except for Indonesia, all the countries experienced a very similar degree (tempo) of reduction in infant mortality during 1960-1980. Although the patterns of decreases were similar, however, there are clear differentials in the levels of infant mortality among the countries considered: Singapore again having the lowest rate, similar to those of Japan and Hong Kong; Malaysia being the second, with slight but steady decreases in her lag behind Singapore; the third place being taken by Thailand and the Philippines with almost no differences between them; and finally Indonesia being the slowest in infant mortality reduction, with little achievement during 1970-1980.

Figure 5C shows that among the South Asian countries considered, Sri Lanka is a clear exception with a steady decline in her infant mortality rate from around 71 in 1960 to 44 in 1980. The remaining three countries (India, Pakistan, and Bangladesh) continued to have high infant mortality throughout the period under consideration. Although Indian and Pakistan showed a slight reduction, their rates were still high (approximately 125) in 1980, and Bangladesh had virtually no decline in her infant mortality rate during 1960-1980.

Among the Pacific countries considered (see Figure 5D), the two developed countries in Oceania (Australia and New Zealand) already had infant mortality considerably lower than that of Japan in 1960. Compared with Japan, however, the tempo of their decline was slower. Consequently, they were quickly matched by Japan by the mid-1960s and since then surpassed. Their recent infant mortality rates are similar to those of such Asian NICs as Hong Kong and Singapore. In contrast to Australia and New Zealand, Papua New Guinea shows high infant mortality. Although the country experienced a steady decline during 1960-1980, the rate in 1980 is still comparable to that of Indonesia, the slowest achiever in Southeast Asia, in the same year.

One additional issue we would like to discuss in this subsection is the possible effects of infant mortality (more accurately, the probability of infant survival to adulthood) on fertility demand. As pointed out by Bongaarts and Menken (1983), the probability of infant survival to adulthood, together with natural fertility, determine the supply of children (defined as the number of surviving children a couple would have if they made no deliberate attempt at fertility control). On this supply-demand relationship in fertility, some claim

Figure 5A. Infant Mortality Rates per 1,000 Live Births: Selected Countries in East Asia, 1950-1980

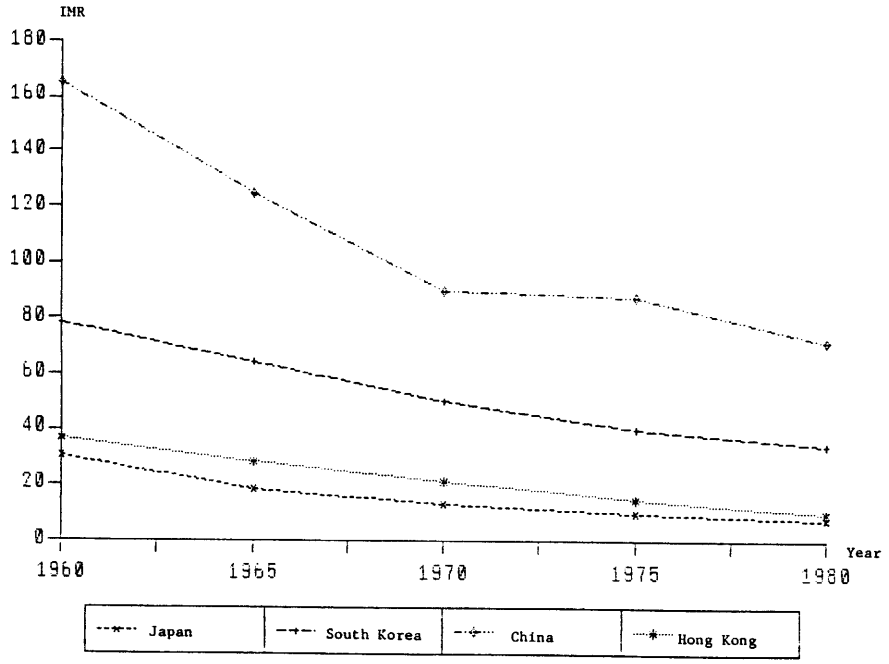


Figure 5B. Infant Mortality Rates per 1,000 Live Births: Selected Countries in Southeast Asia, 1950-1980

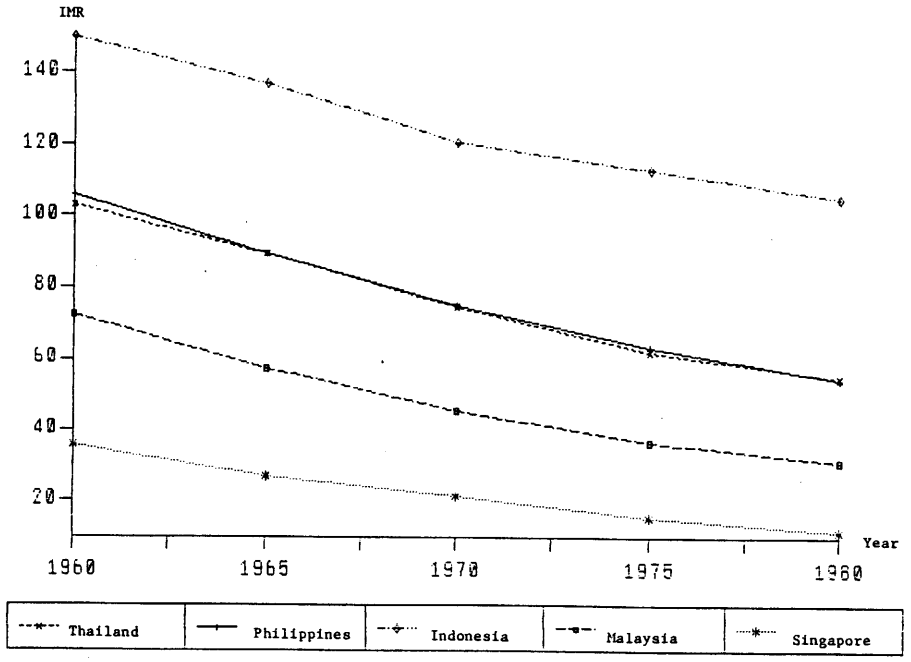


Figure 5C. Infant Mortality Rates per 1,000 Live Births: Selected Countries in South Asia, 1950-1980

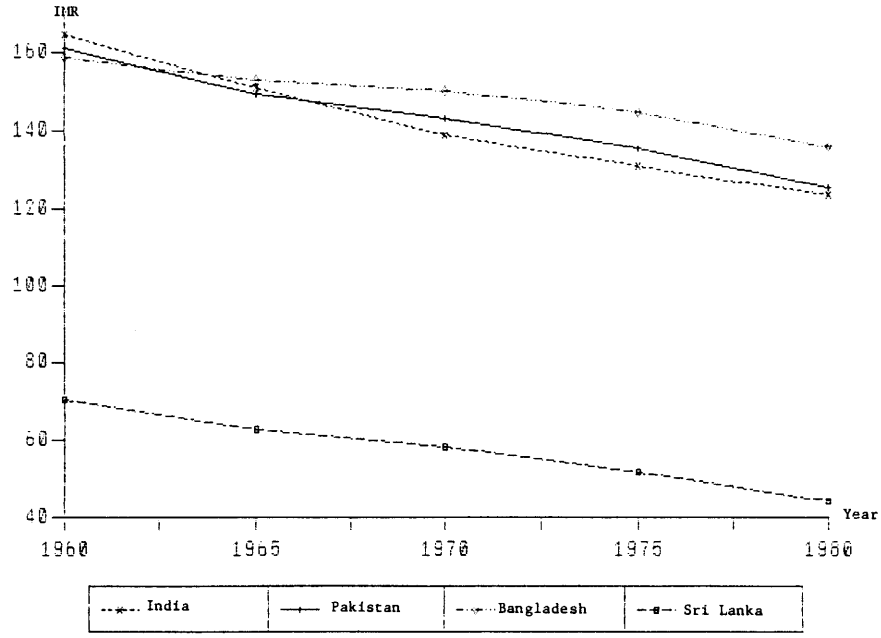
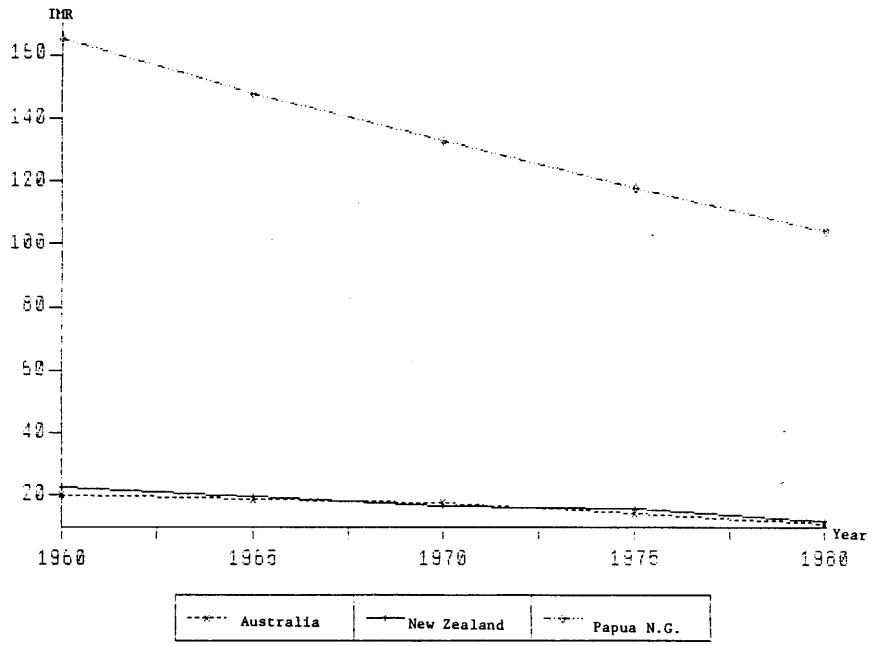


Figure 5D. Infant Mortality Rates per 1,000 Live Birth: Selected Countries in the Pacific, 1950-1980



that while being a fertility supply factor, the probability of infant survival (infant mortality rate) is also a determinant of fertility demand since couples determine the level of their demand by taking the probability of infant survival into account (e.g., Easterlin, 1978). However, some others question the feasibility of this possible interaction between fertility demand and supply, especially for developing countries (e.g., McClelland, 1983; Lee and Bulatao, 1983). Theoretically, we can treat fertility supply and demand either separately or independently. In practice, however, it is difficult to determine fertility demand, and to measure the possible effects of infant mortality on fertility. This is one of the important issues remaining for further research.

d. Governments perceptions and policies on population

As mentioned before, demographic (especially fertility) experiences of many non-Western countries led us to pose questions about the validity of the "classical" model of demographic transition that regards socioeconomic development as a prerequisite for the transition. For example, evidence from such Asian countries as Japan, Thailand, Taiwan and Singapore indicates that fertility decline can be independent of development, and that the decline may even facilitate development (Freedman and Takeshita, 1969; Knodel and Debavalya, 1978, Hogan and Frenzen, 1981; Donaldson et al., 1982; Tsuya, 1986). The factor which made this separation between development and fertility decline possible is the systematic governmental effort to bring down fertility, generally called "family planning programs". In fact, this is the idea underlying the strong enforcement of one-child family policy in China in recent years (Chen, 1978).

Similar comments can also be made concerning the effects of governmental intervention on mortality reduction in developing countries. In many developing countries, unlike their Western predecessors, significant mortality decline took place without accompanying substantial socioeconomic development. This was due mainly to importation of medical knowledge and technology from the West, and to the subsequent spread of ideas on public health and hygiene through governmental programs.

When significant mortality reduction occurred in many developing

countries, however, they were not necessarily followed by fertility decline. As a result, regions such as Africa and Latin America and part of Asia experienced dramatic growth in their population, commonly known as "population explosion" (Hauser, 1971; Kirk, 1971). On the other hand, during the late 1960s and 1970s, many NICs and developing countries in Asia achieved a substantial slowing-down in their population growth mainly through rigorous control of their fertility. Concluding Section II, we briefly review governments' perception and policies on population in the context of actual demographic changes, which we have just examined.

Governments' perceptions and intervention in reference to population growth and fertility as of 1983 are summarized for the Asian and Pacific countries under consideration in Table 4. Table 5 presents a summary of a range of average life expectancy at birth during 1980-1985 and governments' perception of its acceptability. From Table 4, we can see that while all the developed countries in the region perceive their population growth rates and fertility as satisfactory, and indicate that no policy intervention is necessary, South Korea and China regard their rates as too high, and expressed the necessity of intervention. It is interesting to compare these two East Asian countries with such success cases in Southeast Asia as Singapore and Thailand who regard their rates as satisfactory. Although Singapore's fertility is lower than those of South Korea and China in 1980, the differences were not large. Moreover, Thailand had higher fertility than these two East Asian countries in 1980. Considering the demographic accomplishments made by South Korea and China during the 1970s and early 1980s, it is assumed that their perception for further population control is based not only on urgent need for quick socio-economic development, but also on their hope to catch up with their East Asian counterparts.

Regarding the information presented in Table 4, we would like to add three more points: First, as shown in the table, Singapore has indicated their long-term demographic goal as stabilization of the population early in the twenty-first century (Saw, 1987). In order to attain this goal, it was necessary to reduce their fertility to replacement level (which was successfully accomplished in 1975) and then to maintain this level. This latter condition, however, was never met; fertility kept declining at a below-replacement level, and there-

Table 4. Governments' Perception and Intervention concerning Population Growth and Fertility: Selected Countries in Asia and the Pacific, 1983

Country	Perception	Intervention
POPULATION GROWTH RATES:		
Japan	Rates satisfactory	No direct intervention reported
South Korea	Rates too high	Intervention to lower rates
China	Rates too high	Intervention to lower rates
Hong Kong	(Data not available)	
Singapore	Rates satisfactory	Intervention to maintain rates
Thailand	Rates satisfactory	Intervention to lower rates
Philippines	Rates too high	Intervention to lower rates
Indonesia	Rates too high	Intervention to lower rates
Malaysia	Rates too high	Intervention to lower rates
India	Rates too high	Intervention to lower rates
Pakistan	Rates too high	Intervention to lower rates
Bangladesh	Rates too high	Intervention to lower rates
Sri Lanka	Rates too high	Intervention to lower rates
Australia	Rates satisfactory	Intervention to maintain rates
New Zealand	Rates satisfactory	No direct intervention reported
Papua New Guinea	Rates too high	Intervention to lower rates
FERTILITY:		
Japan	Rates satisfactory	Intervention not appropriate
South Korea	Rates too high	Intervention to lower rates
China	Rates too high	Intervention to lower rates
Hong Kong	(Data not available)	
Singapore	Rates satisfactory	Intervention to maintain rates
Thailand	Rates satisfactory	Intervention to lower rates
Philippines	Rates too high	Intervention to lower rates
Indonesia	Rates too high	Intervention to lower rates
Malaysia	Rates too high	Intervention to lower rates
India	Rates too high	Intervention to lower rates
Pakistan	Rates too high	Intervention to lower rates
Bangladesh	Rates too high	Intervention to lower rates
Sri Lanka	Rates too high	Intervention to lower rates
Australia	Rates satisfactory	Intervention not appropriate
New Zealand	Rates satisfactory	Intervention not appropriate
Papua New Guinea	Rates too high	Intervention not appropriate

Source: United Nations. 1985. World Population Trends, Population and Development Interrelations and Population Policies: 1983 Monitoring Report, Volume II. New York: United Nations.

Table 5. Average Life Expectancy at Birth during 1980-1985 and Governments' Perceptions of Its Acceptability: Selected Countries in Asia and the Pacific, 1983

Country	Life Expectancy Range	Perception of Acceptability
Japan	70+	Acceptable
South Korea	62-69	Not accpetable
China	62-69	Not acceptable
Hong Kong	(No data available)	
Singapore	70+	Acceptable
Thailand	62-69	Acceptable
Philippines	62-69	Acceptable
Indonesia	50-61	Not acceptable
Malaysia	62-69	Acceptable
India	50-61	Not acceptable
Pakistan	50-61	Not acceptable
Bangaldesh	Under 50	Not acceptable
Sri Lanka	62-69	Not acceptable
Australia	70+	Acceptable
New Zealand	70+	Acceptable
Papua New Guinea	50-61	Not acceptable

Source: The same as Table 4.

fore the government has just implemented a program in 1987 to motivate people to have more children with considerable monetary incentives (Saw, 1987). It will be interesting to see how this program affects Singapore's fertility.

Secondly, in late 1982, the Malaysian government announced a population policy to increase their population to 70 million by 2100 (Takeshita, 1987). Although the degree of its possible implementation is seriously doubted by many, it is remarkable to see a government of a developing country come up with a strong pronatal policy. Thirdly, South Asian countries, except for Sri Lanka, have not yet succeeded in entering a fertility transition although they all (including Sri Lanka) express the necessity of and actual attempts at governmental intervention to promote fertility (and therefore population) control. This seems to indicate the inefficiency and ineffectiveness of their intervention measures, suggesting the need of further improvements of their population control programs.

III. Interrelations between Demographic Changes and Socioeconomic Factors

Complexity in explaining the relationship between demographic changes and socioeconomic development stems basically from the fact that it is not clear how each social and economic factor affects demographic variables nor how, in turn, demographic changes influence socioeconomic development. Although any causal explanation of demographic changes has to acknowledge the roles played by such socioeconomic factors as rising levels of education, industrialization, and the changing status of women, this ambiguity in the precise nature of the causal influences makes it difficult to explain the relationship between demographic changes and socioeconomic development.

In this section, we first look at trends of changes during 1960-1980 in the level of economic development, as reflected in GNP per capita as well as changes in such human resource indicators as primary and secondary school enrollment ratios, female labor force participation rate, and proportion of labor force in agriculture. We then examine changes in the degree of association between a level of economic development and socio-demographic characteristics of population,

namely, fertility, mortality, education, and labor force. Lastly, we attempt to analyze social and demographic determinants of inter-country differentials in recent economic development, utilizing regression model analyses.

Table 6 presents changes in GNP per capita at constant prices (1975 U.S. dollars) for the Asian and Pacific countries under consideration. The table clearly shows the rapidity of economic growth the region as a whole experienced during 1960-1980. The growth rates of East and Southeast Asian countries were especially impressive although that of South Asia appears to show some sign of economic stagnation.

Tables 7 and 8 present changes in primary and secondary school enrollment ratios during 1960-1980. These ratios express enrollment of all ages in primary or secondary schools as a percentage of the population of primary/secondary school age. From Table 7, we can see that primary education has become almost universal in Asia and the Pacific, except for Papua New Guinea and such South Asian countries as India, Pakistan, and Bangladesh. Even in these countries in which primary education has not yet become universal, the proportion of population with primary education appears to be increasing steadily. In contrast to primary education, however, substantial differences in the extent of dissemination of secondary education can be found among the Asian and Pacific countries considered. Specifically, as shown in Table 8, a vast majority of the population has acquired secondary education in the three developed countries in the region (Japan, Australia, and New Zealand), and the quickness of the spread of secondary education in South Korea during 1960-1980 is remarkable. Some other countries have also made, if not as much as South Korea, significant achievement in spreading secondary education, whereas some others made very little progress.

Turning to changes in labor force variables, Table 9 presents changes in female labor force participation rate during 1960-1980. We can notice from the table that although the female labor participation rate has been increasing in many Asian and the Pacific countries, the rate of increase appears to be generally low. At the same time, for the countries that experienced decline in female labor force participation rate, the amount of the decline was very small. Altogether, we can say that during the period 1960-1980, despite the general trend of a slow but steady rise in the rate, countries in the Asian and Pacific

Table 6. GNP per Capita at Constant Prices*: Selected Countries in Asia and the Pacific, 1960-1980

Country	1960	1965	1970	1975	1980
EAST ASIA					
Japan	1537	2350	3809	4449	5437
South Korea	235	277	397	578	756
China**	-	-	-	-	-
Hong Kong	754	1145	1523	1910	3019
SOUTHEAST ASIA					
Singapore	922	1062	1741	2491	3406
Thailand	181	222	297	350	441
Philippines	257	288	315	376	442
Indonesia	-	-	177	224	292
Malaysia	414	503	588	731	963
SOUTH ASIA					
India	114	120	134	140	151
Pakistan	104	129	159	162	196
Bangladesh	184	205	215	180	215
Sri Lanka	165	176	205	217	269
PACIFIC					
Australia	4544	5195	6356	6847	7355
New Zealand	3227	3559	3864	4402	4073
Papua New Guinea	294	375	448	475	461

* At 1975 prices in U.S. dollars.
** GNP per capita was not computed due to the lack of 1975 deflator value.

Sources: World Bank, World Development Report 1983;
United Nations, 1986 Statistical Yearbook.

Table 7. Primary School Enrollment Ratio: Selected Countries in Asia and the Pacific, 1960-1980

Country	1960	1965	1970	1975	1980
EAST ASIA					
Japan	103	100	99	99	101
South Korea	94	101	103	107	109
China	109	-	110	114	121
Hong Kong	87	103	117	120	109
SOUTHEAST ASIA					
Singapore	111	105	106	111	107
Thailand	83	78	83	84	96
Philippines	95	113	108	108	110
Indonesia	71	72	77	83	112
Malaysia	96	90	87	91	92
SOUTH ASIA					
India	61	74	73	76	72
Pakistan	30	40	40	46	52
Bangladesh	47	49	52	71	63
Sri Lanka	95	93	99	77	100
PACIFIC					
Australia	103	99	115	107	110
New Zealand	108	106	110	107	105
Papua New Guinea	32	44	52	56	63

Source: United Nations. 1984. World Tables, 3rd Edition, Volume II: Social Data. Baltimore: Johns Hopkins University Press.

Table 8. Secondary School Enrollment Ratio: Selected Countries in Asia and the Pacific, 1960-1980

Country	1960	1965	1970	1975	1980
EAST ASIA					
Japan	74	82	86	91	91
South Korea	27	35	42	56	80
China	21	-	23	56	43
Hong Kong	20	29	36	49	62
SOUTHEAST ASIA					
Singapore	32	45	46	53	55
Thailand	13	14	17	26	29
Philippines	26	41	46	54	63
Indonesia	6	12	15	19	28
Malaysia	19	28	34	43	51
SOUTH ASIA					
India	20	27	26	26	30
Pakistan	11	12	13	15	15*
Bangladesh	8	13	19	25	15
Sri Lanka	27	35	47	48	51
PACIFIC					
Australia	51	62	82	87	86
New Zealand	73	75	77	81	81
Papua New Guinea	1	4	8	12	12

*1979 data.

Source: The same as Table 7.

Table 9. Female Labor Force Participation Rate: Selected Countries in Asia and the Pacific, 1960-1980

Country	1960	1965	1970	1975	1980
EAST ASIA					
Japan	36.0	38.0	39.3	40.2	41.4
South Korea	17.2	19.8	23.0	24.2	25.1
China	37.0*	35.3	35.0	35.5	35.5
Hong Kong	22.6	24.7	28.3	30.5	32.0
SOUTHEAST ASIA					
Singapore	14.5	15.5	18.7	20.6	21.5
Thailand	49.8	46.3	43.9	43.4	44.2
Philippines	29.4	25.9	24.4	23.6	23.2
Indonesia	20.0	20.6	21.6	21.0	20.9
Malaysia	18.9	19.9	21.5	21.7	22.1
SOUTH ASIA					
India	27.3	27.0	26.9	26.2	25.9
Pakistan	5.7	5.6	5.5	5.7	5.9
Bangladesh	11.4	11.6	11.9	12.1	12.9
Sri Lanka	16.2	16.6	16.5	16.8	17.4
PACIFIC					
Australia	20.2	23.5	26.5	27.5	28.7
New Zealand	18.7	21.1	23.0	24.2	25.5
Papua New Guinea	47.7	46.2	44.9	43.6	42.2

*1957 data.

Source: The same as Table 7.

region experienced relatively little change in the overall level of female labor force participation.

Table 10 presents changes in the proportion of labor force in agriculture during 1960-1980. The countries under consideration show very different levels in their proportions of agricultural labor force owing to the fact that the region includes such city state countries as Hong Kong and Singapore (which have little land for large-scale agriculture), and such developed countries as Japan, Australia, and New Zealand. Although there remain significant differences in the proportions per se, however, all the countries have experienced decreases in the proportion of agricultural labor force during 1960-1980, indicating an overall trend of increasing industrialization.

We next examine changes in the strength of association of these human resource factors and demographic variables examined in the previous section with the level of economic development. Table 11 presents the estimated Pearson correlation coefficients of the social and demographic variables under consideration. We can see from the table that GNP per capita has strong negative correlations with TFR, infant mortality rate, and proportion of labor force in agriculture. Furthermore, the degree of negative association generally increased during 1960-1980. In contrast, the level of economic growth is found to have strong positive correlations with secondary school enrollment ratio and life expectancy at birth. Meanwhile, the correlations between GNP per capita and primary school enrollment ratio and female labor force participation rate showed an intermediate level of association, although the strength of association of female labor force participation increased considerably during 1960-1975. From these findings, we therefore can suppose that all the demographic and human resource factors under consideration are important in explaining inter-country differentials in economic development levels.

Based on these results of correlations, we next conduct regression analyses of inter-country differentials in recent economic development on these demographic and human resource variables. Since we do not have a large enough number of countries for regression analyses, we pooled 1975 and 1980 data together by introducing a dummy variable (called "Year") to account for the possible year-specific effects. In addition, we decided to adopt infant mortality rate instead of life expectancy at birth as an indicator of mortality since

Table 10. Proportion of Labor Force in Agriculture: Selected Countries in Asia and the Pacific, 1960-1980

Country	1960	1965	1970	1975	1980
EAST ASIA					
Japan	33.0	26.0	20.0	15.6	12.0
South Korea	66.0	58.3	50.0	41.9	35.5
China	-	-	-	-	73.8*
Hong Kong	8.0	5.7	4.0	3.5	3.0
SOUTHEAST ASIA					
Singapore	8.0	5.7	4.0	2.8	2.0
Thailand	84.0	82.1	80.0	78.1	76.0
Philippines	61.0	57.1	53.0	49.5	46.0
Indonesia	75.0	70.7	66.0	60.7	55.0
Malaysia	63.0	59.5	56.0	53.0	50.0
SOUTH ASIA					
India	74.0	74.0	74.0	71.7	69.3
Pakistan	61.0	60.0	59.0	58.0	57.0
Bangladesh	87.0	86.5	86.0	81.1	74.0
Sri Lanka	56.0	55.5	55.0	54.5	54.0
PACIFIC					
Australia	11.4	9.6	8.1	6.8	5.6
New Zealand	14.7	13.2	11.9	10.4	9.0
Papua New Guinea	89.0	87.6	86.0	84.1	82.1

* 1979 data

Source: The same as Table 7.

Table 11. Estimated Degree of Association between Selected Socio-Demographic Variables and GNP per Capita,1960-1980

Variables	1960	1965	1970	1975	1980
GNP per capita	1.000	1.000	1.000	1.000	1.000
TFR	-0.633	-0.708	-0.762	-0.792	-0.804
Life expectancy at birth	0.716	0.713	0.743	0.736	0.777
Infant mortality rate	-0.666	-0.654	-0.683	-0.665	-0.722
Primary school enrollment ratio	0.518	0.422	0.548	0.526	0.462
Secondary school enrollment ratio	0.757	0.784	0.879	0.859	0.776
Female labor force participation rate	0.227	0.360	0.450	0.471	0.447
Proportion of labor force in agriculture	-0.691	-0.712	-0.766	-0.787	-0.831

Note: The figures are the estimated Pearson correlation coefficients.

there is a very strong multicolinearity between these two variables. Although life expectancy is often a good overall measure of mortality, infant mortality rate is a measure more sensitive to socioeconomic development. Since there was little difference in the results, we decided to utilize infant mortality rate as one of our explanatory variables.

Table 12 presents the results of regression analysis of GNP per capita in 1975-1980 on the demographic and human resource variables under consideration. As shown in the table, when we do not include proportion of agricultural labor force in the regression model (see Model 1 of Table 12), TFR and secondary education are found to have significant effects on economic development, although the effect of TFR is, as expected, negative while that of secondary education is positive. None of the other independent variables are found to have significant effects on GNP per capita, although the effect of primary education is, though insignificant, considerable.

When we include the variable of the proportion of agricultural labor force in the model (see Model 2 in Table 12), however, proportion of agricultural labor force and primary school enrollment, in addition to secondary education, come to have a significant effect on economic development while TFR loses its significance as an explanatory variable. Interestingly, while secondary education maintained its significant positive effect, primary education comes to have a significant negative effect on economic development, indicating that the prevalence of primary education has little effect on economic development and that what really facilitates economic development is the spread of secondary education. This agrees with the findings of many other studies of educational impacts on economic development (Oshima, 1980, 1982, 1983a, 1983b, 1986).

Furthermore, disappearance of the significance of TFR as an explanatory variable is thought to be caused by the introduction of a proportion of labor force in agriculture to the regression model. This disappearance is due probably to the strong negative correlation between these two variables. In other words, the explanatory power TFR had in Model 1 was in fact due ultimately to inter-country differentials in proportion of agricultural labor force, and TFR is an intermediate variable in the causal relationship between the proportion in agriculture and economic development. The remaining variation

Table 12. Selected Statistics from Regression Analyses of GNP per Capita on Selected Social and Demographic Variables

Explanatory Variables	Model 1		Model 2	
	Beta	T-ratio	Beta	T-ratio
Intercept	5884.6	1.896	4174.1	1.480
TFR	-1087.2*	-2.791	-323.24	-0.722
Infant mortality	14.44	1.081	16.19	1.369
Primary school enrollment	-35.72	-1.824	-36.15	-2.087*
Secondary school enrollment	51.87**	2.875	42.99	2.637*
Female labor force participation	6.24	0.246	47.71	1.750
Proportion of agricultural labor			-50.63	-2.669*
Year (1980=1)	-204.97	-0.443	14.50	0.035
R-Square	0.6870		0.7551	
Number of Cases	29		29	

*Significant at 0.05 level.
**Significant at 0.01 level.

of GNP per capita explained by TFR (in Model 2) is therefore considered to be a proxy for the effects of family planning programs, implying the relative ineffectiveness of governmental (or private) intervention programs for fertility control when they do not accompany, at least partial, socioeconomic developmental changes.

In summary, through the regression analyses of recent economic development on major demographic and human resource variables, we found: (1) secondary education has a significant positive effect on economic development while primary education has no such effect; (2) level of fertility affected economic development significantly only in the sense that decline in the proportion of labor force in agriculture resulted in decreases in TFR, which in turn facilitated economic development; and (3) mortality reduction and female labor force participation did not have significant effects on recent economic development in the region.

IV. Subregional Differences in the Role of Human Resources in Asian Economic Growth: A Comparative Analysis

Several sources-of-growth studies on the U.S. economy were undertaken in the late 1950s and throughout the 1960s (Schultz, 1961; Denison, 1967). These studies pointed to the importance of human capital in the process of economic progress. Partly based upon this well-known finding, many developing nations started to make strenuous efforts with much enthusiasm to strengthen their educational programs as a means to the uplift of their undeveloped economies. At one of the conferences held in Karachi in 1960, many Asian governments agreed upon plans for seven years of cost-free, compulsory public education by 1980. It is important to note, however, that more than one-third of the countries failed to achieve this policy target, and some of those which managed to meet this goal did so only by lowering the quality of education to a substantial degree (Oshima, 1986). Although it is difficult to pinpoint the reasons for the reduced enthusiasm for human resources development among some of the Asian developing countries in recent years, it has been speculated that despite the fact that human development is a slow process, too much was expected from education in the short run (Oshima, 1986).

It should be stressed, however, that the extent to which education has contributed to economic growth varies from country to country in Asia. The inter-country differences in the magnitude of the contribution of human resources development to economic growth are partially reflected by the differentiation or widening gap in the average incomes of Asian countries. In 1985, per capita GNP for Japan, which is the premier economy in Asia, is 75 times higher than that for Bangladesh, the country with the lowest income level in Asia (World Bank, 1987). In the early 1950s, however, the difference between the highest and lowest income countries was only 3 or 4 times. Moreover, the per capita income gap is also pronounced among the three main sub-regions of Asia. At present, East Asia (including Japan, South Korea, and Hong Kong) has a per capita income 2.9 times higher than that for Southeast Asia (ASEAN countries without Brunei), while the latter is 8.2 times higher than that for South Asia (including Burma, India, Bangladesh, Sri Lanka, and Pakistan). In view of such large sub-regional income differences, we will briefly review the role of human resources in the postwar aggregate growth of these three sub-regions, by highlighting the experiences of a few selected countries in each sub-region.

a. East Asia

Let us discuss Japan first, and then, South Korea as representatives of East Asia. At the close of World War II, the Japanese economy was severely crippled and in shambles. In his paper presented at a conference in 1949, Warren Thompson, a noted American demographer, stated, after serving as a population adviser to General MacArthur:

> Japan can no doubt increase her resources significantly through trade as she did in the past. Malaya will take a certain amount of Japanese goods--textiles, bicycles, rubber shoes, flashlights, etc--for iron ore, rubber, and tin. ...[A] similar trade with Indonesia, the Philippines, and other Asiatic countries should be possible. ... On the other hand Japan's competitive position in foreign trade will improve by a general increase in her industrial efficiency. ... But it is by no means

certain that this improvement will be rapid or that it will be sufficiently great to enable Japan to meet European and American competition in many lines where good machinery, efficient labor, and good business organization can offset lower wages in maintaining low unit costs. ...I do not believe the means of relieving the pressure of population on resources which have been discussed above will do a great deal to help Japan within the next decade or two (Thompson, 1950).

In retrospect, it is easy to see where Thompson went wrong in foreseeing Japan's miraculous economic recovery in the 1950s and 1960s. One of the sources of his misjudgment is related to the framework in which international economic relations were to be conducted in the postwar period. In addition, he clearly underestimated the magnitude of fertility reduction which occurred from the late 1940s and throughout the 1950s. More importantly, Thompson greatly underestimated the qualities of the Japanese labor force available subsequent to World War II. It has been pointed out in a number of recent studies (Oshima, 1982, 1983a, 1983b and 1986; Cummings, 1980; Ohkawa and Shinohara, 1979) that the rapidity of changes in the Japanese economy during the 1950s would not have been possible without the high quality of manpower which had originated in the prewar decades. To further endorse the validity of this view, it is useful to compare, as shown in Table 13, intertemporal changes in the following four indicators: (1) national income, (2) labor force (gainfully employed population), (3) physical capital (national wealth), and (4) educational capital. Over the period 1905-1935, the labor force increased 1.23 times, from 25.6 to 31.4 million, while physical capital increased by about 4.5 times, from 5.8 to 25.9 trillion yen during the same time period. Also, the national income showed a pronounced increase: nearly 4.3 times, from 1.2 to 5.2 billion yen. More important, educational capital expanded by about 8.3 times from 0.31 trillion yen in 1905 to 2.56 trillion yen in 1935, thus exceeding the growth rate of all other indicators (Okita et al., 1982). These statistics indicate that Japan placed an enormous stress upon human resources development in the allocation of her resources during the prewar period. In 1950, the average worker on rural farms had 7 years of schooling, while the average worker engaged in the urban industrial sector had approximately 10 years of school-

Table 13. Increase of National Income, Labor Force, Physical Capital, Educational Capital

Year	National Income		Labor Force		Physical Capital		Educational Capital	
	Amount	Index	Amount	Index	Amount	Index	Amount	Index
	billion yen		million yen		trillion yen		10 billion yen	
1905	1.210	100	25.6	100	5.8	100	31	100
1910	1.559	129	26.2	102	8.0	138	47	152
1913	2.045	169	26.4	103	8.6	148	59	188
1917	2.035	168	26.6	104	8.5	147	73	236
1919	2.761	228	26.6	104	10.1	174	81	260
1924	3.026	250	28.2	110	17.6	304	110	367
1930	4.054	335	29.3	115	23.1	398	186	600
1935	5.234	433	31.4	123	25.9	447	256	831
1955	7.189	594	39.2	153	21.7	374	538	1,731
1960	11.822	979	43.7	171	39.8	686	711	2,286

Source: Ministry of Education, Growth and Education in Japan: Development of Education and Economic Growth (in Japanese), November 1962, p. 11.

Remarks: National income, material capital (national wealth), and educational capital are expressed in 1960 prices.

ing. These levels of educational attainment among these workers were by far the highest in Asia at that time.

Immediately after World War II, Japan pursued a policy of agricultural development which enhanced the work motivation of all peasants through institutional changes such as the land reform of the late 1940s, which in turn, reduced substantially the power and privileges of large landowners. It was the high level of educational attainment of the farm labor force and its technological experiences accumulated since the Meiji period that made these institutional changes extremely effective in enabling the peasantry to improve the productivity of the land when new opportunities arose (Oshima, 1982).

In addition to these major institutional changes, loans from cooperatives and other institutions facilitated machinery purchases for farmers without savings. It is important to note that although it was small-scale mechanization for small farms (mostly less than one hectare), machines were useful in replacing labor during the peak season of plowing, planting, and harvesting. Because these machines were easy to operate even for women, the small-scale mechanization process induced a greater participation of women in farm activities. In 1949, the agricultural labor force was evenly divided between men and women, but the latter exceeded the former by 12 percent in 1961. In addition to such small-scale mechanization, heavy fertilizing gave rise to a marked improvement in output per hectare. Furthermore, the introduction of multiple cropping and the gradual shift to the diversified production pattern led to a sharp rise in total factor productivity in the rural economy. It is particularly important to note that most of the diversified agricultural products did not constitute a conflict of timing with rice production in the use of labor. Hence, the diversified production pattern was conducive to more even utilization of labor and machines throughout the year, and consequently to higher farm family incomes. As a result of these dynamic changes in the agricultural sector, both the level and distribution of farm family incomes improved pronouncedly.

Due to the rapid expansion of agricultural production, Japan's supply of foodstuffs became self-sufficient, which, in turn, converted the large deficits in the balance of payments to surpluses by the end of the 1950s. These surpluses were used for the further importation of machinery for heavy industrialization in the 1960s. As was the case

with agriculture, the high-level of schooling among laborers, combined with industrial experience acquried from several prewar decades, was a main source of the efficiency of Japanese industrial development. As extensively discussed elsewhere (Ogawa and Suits, 1982; Ogawa, 1986), a large part of the high-quality labor force absorbed into urban industrial sectors was transferred from the rural agricultural sector, because young rural workers could be released from agricultural activities through small-scale mechanization as well as the increased participation of middle-aged women in the farm labor force. Table 14 clearly documents the trend of rural-urban migratory flow. It is important to observe that net in-migration from nonmetropolitan to metropolitan areas was at a high level from the late 1950s to the early 1960s, with its peak in 1961 being a total of 655,000 in-migrants. One of the primary factors contributing to the decline in the volume of in-migration into the metropolitan area is a decrease in the number of potential out-migrants in the rural side due to the rapid decline in fertility which commenced from the late 1940s (Ogawa, 1986). Moreover, as a result of massive rural-urban migration and fast urban growth, the household size became smaller and the family structure changed from the extended type to the nuclear type, thus leading to a further decline in fertility (Ogawa and Hodge, 1986). These changes seem to indicate that the mobility transition proceeded in parallel with the fertility transition in postwar Japan.

Although it has hardly been touched upon in the literature on Japanese economic development, the baby boom cohorts born from 1947 to 1949 played a significant role in achieving the phenomenal economic growth in the 1960s. During the baby boom period, there were almost 2.7 million births every year. Immediately after the baby boom period, the cohort size shrank dramatically due to the decline of fertility. For instance, the size of the cohorts born in 1957 was only 1.6 million. These large baby boom cohorts entered the labor force in the early 1960s, and contributed to the rapid growth of the Japanese economy as high-quality workers with low wages. Because Japan's industrialization in the early 1960s was still predominantly of the labor-intensive nature, these large cohorts were in great demand in the labor market.

Another important point which has received only limited attention in the literature is the impact of reduced fertility upon capital

Table 14. Changes in Output and Work Force in Agricultural and Nonagricultural Sectors, 1920-1980

Year	Total agricultural output*	Total nonagricultural output*	Number of workers in agriculture**	Number of workers in nonagriculture**
1920	2.667	7.858	14.29	12.98
1925	2.678	9.796	14.21	14.23
1930	2.753	10.470	14.13	15.49
1935	2.664	13.666	14.16	17.24
--	--	--	--	--
1953	4.035	19.344	16.90	22.61
1955	5.348	22.674	16.45	24.77
1960	4.868	38.582	13.91	30.74
1965	5.587	68.105	11.54	37.30
1970	6.168	111.680	8.42	42.68
1975	6.899	140.920	6.18	46.22
1980	6.100	182.700	5.32	50.04

* unit: trillion of 1975 yen
** unit: million persons

Source: As for the pre-war period, the data on the number of workers in each sector have been derived from the estimates prepared by K. Ohkawa (Department of Statistics of the Bank of Japan, 1966) and those on total output, from Estimates of Long-term Economic Statistics in Japan Since 1968 (Ohkawa et al, 1974). As for the post-war period, the labor-related data have been collected from a series of the Annual Report on the Labour Force Survey (Statistics Bureau of the Prime Minister's Office, various years), while the production-oriented data, from published national income statistics (Economic Planning Agency, various years).

formation. One of the recent studies has shown that the economic gain from one birth averted during 1950-1970 amounts to a range of 0.4 to 1.7 million yen (1970 constant prices), depending upon the time horizon and discount rates used (Ogawa, 1981). Subsequent to the Eugenic Protection Law of 1948, the number of abortion cases increased dramatically. Although official statistics show that there were slightly more than one million cases a year in the 1950s, it has been estimated that there were another three or four million unrecorded cases every year during this decade (Muramatsu, 1978). Although it is impossible to accurately estimate the economic gain derived from the births averted by abortion, it can be easily considered that it was quite a substantial amount. In any case, the economic resources saved from averting births were injected into the Japanese economy in the form of investment. Hence, the fertility change occurring from the late 1940s to the latter half of the 1950 provided a useful base for Japan's *miraculous economic growth in the* 1960s.

Once the rural labor surplus was depleted, full employment was attained in the Japanese economy in the early 1960s. In other words, the neoclassical type of wage determination became applicable to the urban industrial labor market. As one of the signs of full employment, wages of the lowest-paid workers (casual and day laborers) began to rise faster than the monthly cash earnings of production workers in manufacturing. The increased wages for the unskilled workers attracted more workers from agriculture, which in turn, led to a rise in total farm family incomes. By 1961, off-farm employment contributed nearly as much as farm incomes, and this share continued to rise steadily thereafter. These changes in the farm households induced further mechanization (tractorization) in agricultural production, and consequently, the output per worker in agriculture increased almost as much as industrial output per worker.

As another signal of full employment, the wages of female textile workers also began to rise faster than those of male machinery workers (Oshima, 1982). The increased female wages attracted more women from the home into the labor market, thus raising their participation in the labor force as paid employees. As a result of the rapid transformation of employment patterns and wage levels, the distribution of income started to improve substantially, as suggested by Kuznets' U-shaped relationship between income distribution and per capita income

changes.

With full employment achieved, Japanese industrial growth in the 1960s accelerated by the fact that labor was substituted by extensive mechanization and other technologies, this substitution process gradually being transferred from the primary industry to the secondary industry, and then to the tertiary industry in the late 1970s. These were the decades when the capital- and knowledge-intensive industries, particularly the heavy industries, were expanded and modernized with the latest technologies from industrialized countries. Because advanced technologies could be easily borrowed from abroad, it was human resources that were strategic to the growth of these heavy industries particularly in terms of selecting, adapting, and operating new technologies (Dension and Chung, 1976; Oshima, 1982, 1986).

It is also important to take into account that when the industrial structure of the Japanese economy shifted to the capital- and knowledge-intensive type, the enrollment rate for secondary and tertiary education rose pronouncedly. Moreover, many economists have pointed out the important role played by in-service training and on-the-job day-to-day learning in the accumulation of skills and know-how of workers. Furthermore, these skills and know-how acquired by the workers have been effectively and efficiently transmitted to other workers primarily because their workplace is usually in an egalitarian atmosphere rather than in a surrounding where occupations are rigidly stratified on the basis of either social classes or modern labor union contracts.

The foregoing discussion suggests that demographic changes, human resources development, and economic growth have been closely interrelated with each other in the process of Japan's postwar economic recovery. In his recent papers, Oshima (1983a, 1983b) has hypothesized that Japan's industrial development induced her rapid fertility reduction. He has argued that in the process of industrialization, the demand for higher education had increased the costs of children, and the long-run benefits of children as a form of old-age insurance had declined as a result of wider availability of the public support system as well as extended opportunities to save and invest in assets. He has also suggested that it was the spread of secondary education that had played a crucial role in linking the industrial and fertility transitions. In view of our analysis presented in this section,

however, Oshima's hypothesis seems to need a further modification to account for the process of Japan's postwar economic growth and demographic transition. In this context, the interaction model, which has recently been formulated by Cho and Togashi (1984), appears to be more relevant.

Let us now briefly discuss the case of South Korea. Like Hong Kong and Singapore, South Korea reached levels of literacy and education as high as those of Japan in the early 1950s. This is partly because under the Japanese dominance, more than 50 percent of the primary-school aged population were attending public schools by the mid-1940s (McGinn et al., 1980). This percentage was much higher than in the colonies of the Dutch, British, and French. More importantly, these public schools were of a high standard. It is interesting to note that as was the case for Japan, these schools emphasized the Confucian values and work education, which in turn, contributed to a strong work ethic and a bureaucracy dedicated to national development (Oshima, 1986).

The pattern of Korea's postwar economic growth is highly comparable to that of Japan, although the former started approximately one decade later than the latter. Korea emphasized her agricultural development in the 1950s and 1960s, while labor-intensive, import-substitution industrialization was promoted in the 1950s, followed by the export-promotion strategy in the 1960s. In the process of pursuing her industrial development, South Korea imported advanced technologies from the United States and Japan, and was assisted financially by the United States.

At present the Korean educational system is under the government's tight control. To succeed in more sophisticated industrialization, however, greater flexibility may need to be introduced into the school system to avoid the great dangers of authoritarianism in human resources development, such as have been experienced by the Philippines (Oshima, 1986).

b. Southeast Asia

Most of the Southeast Asian economies have grown rapidly in the last two decades, although their growth has been less impressive than that for East Asia. The ASEAN countries except for Brunei have

already graduated from the ranks of low-income countries (as classified by the World Bank), to those of middle- or upper middle-income countries. It is important to note, however, that differences in resource endowment and policy orientation make it difficult to generalize about why the ASEAN countries have been successful (Naya, 1987). Despite such difficulties, one can still find some similarities. For instance, the ASEAN countries excluding Singapore are comparatively rich in resource potential, and primary products are the mainstays of their economies and export earnings. Furthermore, the ASEAN countries have open economies and trade has greatly contributed to their recent growth. As a result of the rapid rate of growth of exports, their export-to-income ratios are considerably higher than the ratio for Japan (Campbell, 1987).

Peninsular Malaysia in the first half of the 1980s achieved full employment. It is interesting to observe that in 1985 per capita income for Malaysia was nearly as high as that of the Republic of Korea, though literacy and schooling of the labor force were substantially lower.

In the 1950s, the Philippines started out strong with levels of literacy, schooling, and per capita incomes higher than those for the South Korea. However, these two countries emphasized different development strategies. In the case of Korea, agricultural development was stressed, while the capital-intensive industrialization strategy was pursued by the Philippines. Three decades later, the Philippines ended with lower growth rates, larger amounts of unemployed labor and a higher range of income distribution than in the Republic of Korea. Interestingly enough, Oshima (1980, 1986) has recently pointed out that these differences in the growth performance between the two countries may be attributable to the difference in ways of thinking formed through education during the colonial periods in these societies. In any case, the Philippine experience shows that high levels of human resources development are not a sufficient condition for assuring success in economic development.

Thailand, which, unlike other ASEAN countries, was never occupied by Western powers, mainly on the basis of peasant production, has achieved the most rapid sustained growth among the ASEAN countries. Thailand began her development process in the early 1950s with the smallest amount of modernized manpower among the ASEAN countries, and

with nearly half the per capita income of the Philippines. In the early 1980s, however, the per capita income level of Thailand surpassed that of the Philippines.

During the last two decades, the Southeast Asian countries have succeeded in providing primary education to nearly all children (Wong and Cheung, 1987). A number of these countries, however, have been suffering from high rates of wastage which are most pronounced in the primary level (Poapongsakorn, 1985; Jones, 1988); wastage refers to drop-out and repeater cases. In Indonesia, for instance, only one-half of the pupils who entered primary school graduated from sixth grade in the late 1970s. The repeater rate during the same time period was approximately 12 percent. In Thailand, 23 percent of the children who entered primary school reached grade four in 1980, while the repeater rate for the Thai children was 11 percent. Similar drop-out and repeater patterns can be observed in both Malaysia and the Philippines. These high drop-out and repeater rates seem to reflect that the utility of children as part of the family work-force is high particularly in rural areas. In contrast to these ASEAN countries, Singapore has been enjoying a high retention of pupils in school. However, Singapore is now facing problems of filling lower levels of the occupational structure with willing workers (Postlethwaite and Murray, 1980).

Formal education, particularly in the higher levels, was assigned the strategic task of producing the high-level manpower required for economic development. In Southeast Asia, however, higher education enrollment has risen so rapidly that a large number of secondary vocational and university graduates are confronted with a high incidence of unemployment (Poapongsakorn, 1985). In addition, most of the university students come from relatively wealthy families, which implies that poor families are subsidizing well-to-do families through higher educational programs.

The other educational problem in the Southeast Asian countries is the maladjustment of the educational system to needs of national development; it is often the case that the structure and content of education are a direct copy from advanced countries. Furthermore, these countries have a severe shortage of qualified teachers, so that the quality of education in these countries is considerably lower than in the advanced countries (Jones, 1988). It is reported that high

school graduates in East Asian schools have about the same level of education as college graduates in some of the other Asian countries (Oshima, 1986). In assessing the contribution of education to economic growth, therefore, a production function approach for international comparison may yield misleading results.

Another problem is related to the seasonal fluctuations in the demand for labor in rural areas. In a country like Thailand, for example, a substantial proportion of the agricultural labor force is unemployed during the dry season. To enhance the level of utilization of the labor force, it is highly desirable to strengthen the irrigation system and drainage works.

Despite these numerous human resource problems, Southeast Asia has done considerably better in its postwar economic growth than South Asia. In the 1980s, however, the economic performance of the Southeast Asian countries has varied partly because two of them are oil exporters and others, oil importers, and partly because they followed different domestic policies. Apart from differing oil price fortunes, most of them have been affected by the decline in commodity prices and slow growth in world trade (Campbell, 1987). As a result, except for Malaysia, they have had high debt-service ratios in recent years. The increase in debt relative to GDP has declined in Indonesia and Thailand, but has been high in Malaysia and the Philippines. These countries have recently been experiencing an increase in their foreign resource ratios, and they have had very high net factor payment outflows. It should be noted, however, that the debt situations for these ASEAN countries are still incomparably more sound than those for Latin American NICs (Hayami, 1987).

c. South Asia

Most of the human resource problems in Southeast Asia are highly applicable to South Asia. By and large, these problems are more serious in South Asia than in Southeast Asia. For instance, as compared with the latter, the former has had lower rates of open unemployment and underemployment, and higher rates of female labor force participation. One of the problems which are unique to South Asia lies in its social stratification, an extremely important factor in the human resource development of some of the South Asian countries

such as India and Nepal. Because the labor force is stratified into a large number of occupational groupings, the flow of communication, contacts, or other forms of exchange of information and skills in the workplace are severely limited. This hinders the diffusion of advanced technologies (Oshima, 1980, 1986).

The dualistic nature of educational attainment is another problem. India is a salient example of this problem. Partly due to India's concentration of industrialization on heavy industries, a considerable proportion of the labor force is concentrated on the upper educational levels. Although the literacy level of India is substantially lower than in other developing countries, 8 percent of its population aged 20-24 are enrolled in higher education; the corresponding figure for Sri Lanka is only 3 percent. As a consequence of past low industrial growth rates, India has recently been facing a large surplus of highly educated manpower, in contrast with too little education in the lower echelons (Oshima, 1980, 1986).

Sri Lanka's strong emphasis on human investment rather than on material investment has long been an exceptional case in Asia. The government of Sri Lanka has been providing free primary and secondary education, free health services, subsidized food, housing and transport, and other welfare services. Through these programs, Sri Lanka now enjoys the highest literacy rate in Southeast Asia and South Asia, together with the highest level of life expectancy and the lowest income disparity. But its per capita GNP for 1985 is US$380, which is substantially lower than that for Philippines (US$580). Sri Lanka's experience may suggest that the allocation of resources should be balanced between human and material investment (Oshima, 1986).

Although most of the South Asian countries are pluralistic societies, different from the rest of Asia in terms of culture, religion and many other aspects, surely they could learn much from the experiences of East Asia and Southeast Asia in terms of the interactive process of demographic factors, human resource elements, and economic growth. Nevertheless, attention should be drawn to the fact that despite their relatively poor performance in terms of total growth, the South Asian countries did much better (compared with the other Asian and Pacific developing countries) during the 1980s than they did during the 1970s (Campbell, 1987). The better performance of the South Asian countries during the 1980s seems to be attributable partly

to a result of the slippage elsewhere in the Asian region and partly to improved South Asian policy. The latter is especially noteworthy; although these South Asian countries have been generally inward-looking, and depended upon primary product exports, they have recently been making crescive efforts for promoting trade liberalization and reducing government intervention. If the current trends continue and the required policy reforms are followed, South Asia will be able to make significant strides in increasing productivity and per capita income. Needless to say, better human resources development is likely to play a key role in facilitating such processes.

V. Some Newly-Emerging Issues on Demographic Change and Human Resources Development in Asia

In this section, we will discuss several new and important issues on demographic change and human resources development, by comparing the Japanese case with other Asian countries.

Japan's total fertility rate (TFR) fell by over half from 4.54 to 2.04 children per woman over the period 1947-1957. There was little change until the first oil crisis of 1973, when it began to fall again, and by 1986 the total fertility rate was 1.72. Consequently, the cohort size decreased dramatically in postwar Japan. For instance, the number of births during the baby boom was twice as large as that for 1986. As a result of these fertility changes, the shift in the age structure of the Japanese population has been increasingly pronounced in recent years.

The change in age composition has already started to affect various socioeconomic aspects of Japanese society, particularly public transfer programs such as old-age pension schemes and medical plans. In business circles, there has been a growing awareness of the difficulties likely to arise from the slowing growth of the labor force and from changes in its age composition. Furthermore, these predicted changes in the labor force and in the expenditures on social-security programs may lead to an economic slowdown in the long run (Ogawa, 1982).

The age-structural shifts of the work force have caused a continuous rise in the mean age of workers. It is also important to

observe that there are clear differences in the pattern of increase of the mean age among the various industries. Among nonagricultural industries, for instance, the mining industry has continually shown the highest mean age (43.0 in 1981), and the wholesale and retail trade industry, the lowest one (33.4 in 1981). These inter-industry differences in the age structure of workers have led to a pronounced difference in the upward occupational mobility among various industries, which has, in turn, led to a deterioration in the work morale among young workers. Moreover, due to the inter-industry differences in the age composition of workers, the type of in-service training and the process of mechanization need to be modified in each industry.

These age-structural shifts have recently started to affect the wage system in Japan. Due to the relative increase in aged workers and the relative decrease in young workers, many Japanese businesses have been gradually replacing the seniority-based wage system with an ability-oriented one (Ogawa and Suits, 1983). Moreover, one of the recent studies has found that there is a negative cohort size effect on wages (Martin and Ogawa, 1988); larger cohorts receive lower wages relative to smaller cohorts. Because the educational attainment levels of Japanese workers have been fairly homogenized (Hodge and Ogawa, 1988), the rate of return on education for the large cohorts tends to be lower than that for the small ones.

The changes in the cohort size also affect the utilization of educational facilities. As a consequence of reduced fertility, the teacher-pupil ratio has been rising to a marked extent. In some areas, many elementary schools have already been closed. Educational planning is basically of the long-run nature, so that the education-related infrastructure and manpower which have already been built up cannot be adjusted flexibly in response to the changes in the cohort size. Furthermore, the "echo" effect of changing age structure makes such adjustments even more difficult.

These age-structural and cohort size effects which have already started to make their presence felt in Japanese society are very likely to be increasingly important in some of the Asian countries where the fertility transition is presently underway with the same rapidity as the Japanese postwar case.

As a result of economic progress, better nutritional conditions, advanced medical technologies, and remarkable mortality improvements

were recorded in postwar Japan. The expectation of life at birth for males rose from 50.06 years in 1947 to 75.23 years in 1986, which implies that male life expectancy increased by 25 years in 40 years' time. Due to the rapid extension of life in the past four decades, the older cohorts of the labor force have been compelled to revise continually their retirement plans. Moreover, average retirement age has not been extended as promptly as life expectancy; it was 55.5 years in 1965, and 58.9 years in 1985. During the corresponding period, the expectation of life for males went up by 7.5 years. The average length of retirement increased by more than four years, namely, from 12.24 to 16.33 years. In addition, although male employees start to receive pension benefits from age 60, the amount of benefits has been kept at a relatively low level primarily because of financial difficulties of the pension plans.

In the recent past, Ando (1985) has conducted a study in which he has applied a life-cycle model to the data gathered in the National Survey of Family Income and Expenditure. One of the principal findings of his study is that Japan's high household savings can be attributable to prolonged retirement life. This implies that subject to further mortality improvements and a further rise in retirement age, Japan's household savings might change considerably in the years to come. It should be noted, however, that a substantial rise in retirement age is likely to call for a wide range of human resource development programs for older workers. Thus, the extension of life, household savings, and human resources development are highly interrelated.

As reviewed in Section II, in most of the developing countries in Asia, mortality has been improving at a surprising rate since the end of World War II. The speed of mortality improvements in these countries has been much faster than in the Meiji era when Japan was still at an initial stage of her economic development (Ogawa and Suits, 1982; Demery and Ogawa, 1987). For this reason, in the interactive process of mortality change, household savings, and human resources development, these developing countries may encounter more difficult problems than contemporary Japan.

In the previous section, we have quoted Thompson's statement on the economic potential of postwar Japan. It is apparent that his crucial misjudgement was partly connected with the framework in which international economic relations were to be developed in the postwar

period. He assumed that international trade would be largely confined to bilateral arrangements, and anticipated that the protectionist trade practices would worsen over time. As mentioned earlier, one of the main propellants for the fast economic growth of the ASEAN countries, Hong Kong, and South Korea is active international trade. As displayed in Table 15, these countries have very high export-to-income ratios. The ratio of exports to GNP in 1985 in the ASEAN countries ranged from 14.7 percent for the Philippines to 120 percent for Singapore. The corresponding figure for Hong Kong was 87.3 percent, while it was 34.2 percent for South Korea. In most of these countries, these ratios have been rising over time. It is interesting to observe that the ratio of exports to GNP for Japan was 12.9 percent in 1985, which was considerably lower than most of the countries listed in Table 15. In the decades of rapid growth, the ratio for Japan was approximately 10-11 percent, although there were noticeable fluctuations from year to year.

Table 15. Ratio of Exports of Goods and Services to GNP of Selected Countries in 1985

Country	Ratio (%)
ASEAN	
Indonesia	21.5
Malaysia	49.1
Philippines	14.7
Singapore	120.2
Thailand	17.3
Other Asian developing countries	
Hong Kong	87.3
Korea, Rep. of	34.2
Japan	12.9

Source: World Bank, World Development Report 1987, Oxford University Press, 1987.

A brief comparison of these statistics indicates that the economic performance of the ASEAN countries and Asian NICs is greatly affected by external factors through their international trade. Although there has recently been a growing doubt about the merits and appropriateness of outward-looking policies in these Asian developing countries, if the current trends continue, the future economic growth of these Asian developing countries will be highly dependent upon that of the industrialized countries such as the United States and Japan. As discussed earlier, due to the unprecedented process of population aging, the future prospect of the Japanese economy is not as favorable as before; the relative increase in the aged population and the relative decrease in the young population will likely change the pattern of consumption which may, in turn, affect not only the volume but also the composition of imports from these Asian developing countries. For some time to come, the age structural differences will become increasingly pronounced between the Asian developing countries and the industrialized countries. The net effect will be growth in exports of labor-intensive consumer goods and services from the Asian and Pacific developing countries (Campbell, 1987). More importantly, the aging of the Japanese labor force may slow down the pace of technological progress, thus influencing the pattern of transferring technologies from the industrialized nations to these Asian developing countries.

All of these changes in Japan, coupled with other changes in other industrialized countries, are likely to affect not only the level of utilization of human resources in these Asian developing countries but also their strategies for human resources planning. According to the labor force projections prepared by the Asian Development Bank (ADB), approximately 1.7 million persons are expected to enter the labor force every year for the next decade or so in the four ASEAN countries (excluding Singapore and Brunei) (James, 1985). It is estimated that only 0.5 million workers will be absorbed into the agricultural sector. It can be easily conceived that the majority of the remaining new entrants will seek jobs in urban, industrial sectors. Depending upon the performance of foreign markets particularly in Japan and other industrialized countries, a large number of these new entrants may seek their employment in the urban, informal sector. This implies that the external factors may influence not only the sectoral allocation of human resources but also the

pattern of urban growth and the tempo of urbanization in these developing countries.

At present, the Japanese labor market is virtually closed to foreign guest workers. Nevertheless, the importation of foreign workers is no longer a remote possibility for the following two reasons. First, the process of the aging of the Japanese labor force is expected to accelerate in the next few decades. Second, the number of Japanese workers is expected to decrease continuously around the turn of this century. Then, the question arises: from where will Japan import those workers? It would be sensible to bring them in from some Asian developing countries which have surplus labor and share a similar cultural background. In this context, the interregional flow of human resources and its impact on both sending and receiving countries will be an increasingly important research topic.

Notes

1. The index of the percent of the demographic transition completed was constructed using the following formula:

$$\text{Index} = 0.40\,[(7.5-\text{TFR})/5.3\,] + 0.40\,[1-(75-e_0)/43\,] + 0.20\,[u\,]$$

where TFR= total fertility rate per woman,
e_0 = life expectancy at birth, and
u = percent of population urban.

The constants of the equation were derived by Cho and Togashi (1984), drawing upon Bogue (1969) and utilizing the data provided by the United Nations.

2. CBR indicates a number of births per 1,000 population. Since total population contains those who are not at risk of reproduction such as males and women who are not in reproductive ages, CBR is not a probability-type rate. Moreover, CBR does not control the effects of differences in the age structure. In this sense, the total fertility rate (TFR) is a better measure of fertility since TFR is the sum of age-specific fertility rates of women of reproductive ages. In this section, we decided to utilize CBR, instead of TFR, because of the availability of annual statistics of CBR for most of the countries considered, although TFR is more acceptable as an indicator of fertility levels for comparative purposes.

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