

The Second Demographic Transition in Asia?

Comparative Analysis of the Low Fertility Situation in East and South-East Asian Countries

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Introduction

In the latter half of the 20th century, the world population increased unprecedentedly in large part by the population explosion in the developing region. Such population explosion was caused by widening gap between the rapid mortality decline and the persistence of high fertility. When and how fast fertility in the developing region would decline and whether policy intervention is necessary and effective for fertility reduction in the developing region have been one of the keenest and the most urgent interests related to population-development-environment issues in postwar years in the world.

Fertility transition, that is, fertility decline from a high level to a low level, usually to the replacement level, occurred first in the Western Europe between around the middle of the 19th century and the middle of the 20th century and spread to Southern and Eastern Europe. Japan became the first country which showed just after World War II that fertility transition was possible in non-Western societies. Fertility decline has spread, first, to countries in Asia neighboring Japan and some countries in Latin America, and fertility has started to decline subsequently in the whole developing region including already even a part of sub-Saharan Africa. Fertility decline became “not an exception, but a norm” (Cleland, 1996) in the world. Especially in East and South-East Asia (ESEA), seven countries and areas, including Japan, have already completed fertility transition, by which the pattern of fertility transition has been diversified from the single Western model.

In the 1970s when fertility decline toward the replacement level had started or continued in the developing regions, fertility in the Western societies started to decline below the replacement level. Below-replacement fertility has continued in this region up to now already

for a quarter of a century, and it spread rapidly to Eastern European countries and the former Soviet Union since they began to change their economic system in around 1990. Some demographers called such long-lasting and widening fertility decline below the replacement level which was accompanied by changes in reproductive values, norms and behavior in general as “the second demographic transition” (Van de Kaa, 1987 and 1999; Lesthaeghe, 1999). It still remains to be seen whether the idea of the second demographic transition has such universal applicability outside the European region as the first demographic transition theory. But most of the countries and areas in ESEA that had already completed fertility transition also continued or resumed fertility decline below replacement level.

In this article, seven countries and areas in ESEA, that is Japan, Singapore, Hong Kong, (South) Korea, Thailand, China and Taiwan, which have different cultural background from the Western societies, will be examined with respect to trends in fertility, their demographic determinants, their social and economic background and their relation to the traditional family system, focusing on their comparison between the period of fertility transition and that of below-replacement fertility.

1. Fertility Transition and Below Replacement Fertility in ESEA

1-1. Change in the period total fertility rate (TFR)

It was Japan that had experienced the first fertility transition in ESEA. The TFR in Japan declined from 5.1 to 4.1 between 1925 and 1940, resumed its decline again

from 4.3 in 1949 and reached 2.0, around replacement level (RL), in 1957. The speed of her fertility transition was -0.10 births per woman per year for the prewar period, but it was -0.29 per year for the postwar period. Although the TFR in Japan was stable at around RL between 1957 and 1973, it began to decline again in 1974 below RL by the speed of -0.31 per year and reached 1.34 in 1999 (Figure 1).

Six other countries or areas in ESEA, that have already completed fertility transition, started to decrease their fertility, sooner or later, since the end of the 1950s just after Japan had completed its transition, from somewhat higher levels than Japanese pre-transitional levels. The TFRs in Singapore and Taiwan were still 5.8 in 1960, though it had already started to gradually decline from more than 6.0 in the 1950s. The TFRs in Korea, China, and Thailand were around 6.0 in 1960, when they had not yet started their transition. The TFR in Hong Kong in 1960 was 5.2, close to the pre-transitional level of Japan.

It is in 1975 that the TFR in Singapore reached RL (Saw, 1986). The speed of its decline between 1960 and 1975 was -0.25 births per woman per year, comparable to the speed of postwar transition in Japan. Although Hong Kong started its fertility decline later than Taiwan, her TFR reached RL in 1979 by the speed of -0.16 per year between 1960 and 1979. The TFRs in Taiwan and Korea reached RL in 1983 and 1984 (Gendell, 1989; Freedman et al., 1994) with the speed of -0.16 per year and -0.18 per year respectively. Thailand and China started fertility transition during the 1970s and presumably completed it by the early 1990s (Yu, 1999; Hirschman, 1994; Knodel et al., 1996). The speed of fertility decline was -0.23 per year between 1975 and 1990 and -0.20 per year between 1970 and 1990 respectively.

The speed of fertility transition in these six countries or areas surpassed not only that in the Western societies, around -0.1 of TFR per year between 1880 and 1930, but also that of the prewar transition in Japan. Specifically, fertility in Singapore, Thailand and China declined at the speed comparable to the postwar rapid decline in Japan.

Unlike Japan, the TFRs in five countries and areas in ESEA uninterruptedly declined after they reached RL. The TFR in Singapore decreased to 1.59 in 1983, but it increased thereafter and reached 1.70 in 1996 (Yap, 2000). The TFR in Hong Kong continued to decline and reached all-time low, 0.9 in 1998 and the TFR in Taiwan declined continuously up to 1.72 in 1992. Although the

TFR in Korea had been around 1.7 since the middle of the 1980s, it plunged into 1.48 in 1998 (Cho, 2000). The TFR in China is estimated to have kept about 1.8 in the 1990s. Only Thailand has supposedly maintained RL of fertility in the 1990s (Ruffolo, 2000).

In sum, all the countries and areas that have completed their fertility transition in ESEA, except Thailand, experienced below-replacement fertility for a period of ten to twenty-six years and seemed to enter the second demographic transition comparable to the Western societies.

1-2. Age patterns of childbearing

Fertility decline to the replacement level occurred at all ages of women of reproductive years (Table 1). As for Japan, the forerunner of fertility transition in ESEA, the age-specific fertility rates (ASFR) of women over 30 (ASFR 30+) declined much more than that of women under 30 during the whole period of transition. Divided into prewar and postwar stages, while fertility declined almost equally in all ages for the prewar years, ASFR30+ decline occupied much larger share during the postwar years. Similar to the postwar Japan and the Western societies, the decline in ASFR 30+ contributed to fertility transition, much more considerably than the fertility decline in younger age groups, in Taiwan, China, Korea, and Thailand. But in the case of Singapore and Hong Kong, ASFR declined equally at all ages, similar to the case of the prewar Japan.

Fertility decline in young age groups happened because the age at first birth rose and the second birth interval widened. For instance, an outstanding postponement of the first and the second birth happened in Hong Kong and Singapore where the mean age at first birth increased from 24.4-25.1 years in the late 1960s to 28.1-28.3 years in 1998, and the second birth interval widened by 1.1-1.2 year (Figure 2). Notwithstanding, since fertility decline at older ages outweighed the effect of that at younger ages, the age pattern of childbearing became younger at replacement level than it has been before the onset of fertility transition.

Further fertility decline below replacement level shifted towards younger ages, and the decline of ASFR30+ decelerated in China and Thailand, and reversed in Japan, Singapore and Korea (In this respect Hong Kong was an exception as ASFR kept declining steadily in all groups, resulting in a TFR of 0.9 children per woman). This shift suggests an operational tempo

effect or “recuperation” (Lesthaeghe et al., 2000) similar to what is happening in most of the West and apparently is being set in motion in Eastern Europe. Aging of fertility already occurred in Japan, Hong Kong, Singapore and supposedly Taiwan and just started in Korea and Thailand. Aging of fertility is manifested in increasing average age at childbearing, age at first birth and share of total fertility contributed by older women.

Trends in the difference between period total fertility rates and period average birth order (TFR-ABO) (Figure 3) reveal more about the changes in the age pattern of fertility. During the first stage of the fertility transition childbearing was first rejuvenating in all ESEA countries (positive TFR-ABO values). Subsequently, the rejuvenation subsided. Approximately when TFR reached the replacement level, TFR-ABO became negative - similarly to what happened in most European countries. At below replacement level, the negative values of TFR-ABO continued to increase (with transitory reversals in Japan and Singapore), suggesting aging and “compressing” of childbearing.

However, low-fertility countries currently still differ by age patterns of fertility (Figure 4). Western Europe, Japan, Hong Kong and Singapore have old fertility schedules, where births to mothers older than 29 years contribute 46-49 per cent of TFR, and the age groups 25-29 and 30-34 have the highest ASFR. The United States, Korea and Thailand are characterized by an intermediate pattern with 31-32 per cent of TFR contributed by mothers in their 30s and 40s, and maximum ASFR in the age groups 20-24 and 25-29. Fertility in China and Eastern Europe is still young: women in their late teens and 20s contribute 79-83 per cent of TFR.

1-3.Change in nuptiality

Two demographic factors have been conducive to fertility decline at all ages in ESEA countries or areas: One is changes in marriage behavior and the other is changes in marital fertility.

Unlike the Western societies characterized by later and fewer marriages before fertility transition (Hajnal, 1965), the marriage pattern before fertility transition in ESEA countries or areas was characterized by early and universal marriage. The singulate mean age at marriage (SMAM) before fertility transition was 21 years old for Japan (1920), 20-21 for Korea (1960), Singapore (1957) and Taiwan (1960), 22 for Thailand (1960) and Hong Kong (1961) (Table 2). (Data are not available for pre-

transitional years for China.) The celibacy rate, measured by the proportion never-married among 45-49 year olds, before fertility transition was very low, between 0.1 percent (Korea) and 5.7 percent (Singapore), except in Hong Kong where an exceptionally high percentage (7.4 per cent of 45-49 year olds) remained celibate (Table 3).

Although the marriage pattern hardly changed in the Western European countries when they experienced fertility transition (Coale, 1969; Coale et al., 1986), it changed considerably and contributed to the fertility transition in ESEA countries or areas. The SMAM for seven countries or areas in ESEA increased by 1.5 years (Thailand) to 5.9 years (Singapore), except in China where the data are limited. Such a large increase in SMAM was caused mainly by the rise in the proportion never married for women in their 20s. Meanwhile, the celibacy rate in ESEA rather decreased somewhat, except in Thailand and China.

In the Western societies, marriage changed toward an earlier and more universal pattern after the completion of the fertility transition, which became the prime cause of the postwar baby boom (Bongaarts et al., 1998). Since the 1960s, however, marriage age rose considerably in the Western societies. The postponement of marriage characterizing the period of below replacement fertility there has been closely connected with the spread of cohabitation among the young population (Council of Europe, 1999). Since extra-marital births increased in many Western countries following the prevalence of cohabitation, marriage delay was not necessarily a direct cause of the rise in childbearing ages. But in other Western countries, such as Southern European countries, where neither cohabitation nor extra-marital births increased much, the postponement of marriage directly caused the postponement of childbearing, leading to a considerable decline in TFR.

In the seven countries or areas in ESEA considered in this paper, marriage delay continued into the period of below replacement fertility. SMAM increased by 3.2 years between 1975 and 1995 for Japan, by 3.3 years between 1981 and 1996 for Hong Kong, by 1.4 years between 1980 and 1995 for Korea. SMAM increased also for other countries in ESEA, save China where the data are limited. The rise in SMAM in this period in Japan, Hong Kong and Singapore, also in Taiwan though the data are limited, was brought about mainly by the rise in the proportion never married for women aged 25 to 34 (Tsuya, 1991). In these three countries the celibacy rate

has been increasing somewhat in this period in contrast to the transition period. Since marital fertility has hardly changed and only a delay in marriage has happened in this period in seven countries or areas in ESEA, the latter is estimated to be the prime cause of TFR decline below replacement level.

1-4.Changes in marital fertility and its distribution by birth order

The essence of change in marital fertility can be captured by looking at the number of children ever born for completed families (CEB). In the Western Europe, CEB decreased from about 5.0 children on average for the cohort of ever-married women born in around the beginning of the 19th century to about 2.5 children on average for that born at the beginning of the 20th century, and it continued to decrease up to about 2.0 children (Figure 5).

In most ESEA countries, women born at the beginning of the 20th century had twice as many children as Western Europeans of similar generations: in Japan, CEB was 4.5-5.0, and in Korea, Thailand and Singapore 5.5-6.0. Hong Kong's fertility was exceptionally low (for the region) with CEB at the European level. Then, Japan became the forerunner of fertility transition in Asia and the decline there was faster than in Europe: CEB was decreasing, on average, by 0.1 child for every successive cohort born between 1905 and 1935. Following Japan, CEB for completed families started to decline in other ESEA countries from about 5 to 6 children for cohorts born around 1925 to about 2.2 children (Singapore) - 2.5 children (China) for cohorts born around 1955.

After reaching 2.2 children on average for the cohorts born around 1935, CEB in Japan kept at almost the same level for successive cohorts (NIPSSR,1998a). In ESEA countries, including Japan, it is still guesswork whether or not CEB for completed families would decline for those birth cohorts who reached the prime child-bearing ages after the TFR sank below replacement level.

The essence of fertility transition consists of a shrinking number of large families and increasing share of women with one to three children. In China, Japan, Korea, Hong Kong and Singapore the share of women with four children or more in the cohorts with completed childbearing collapsed from 60 per cent and more to just 8-17 per cent (Figure 6), perfectly mirroring the trends in CEB of these cohorts (Figure 5).

Similarly, period fertility rates for high birth or-

ders (Figure 7) plummeted, closely reflecting trends of TFR. For instance, in the 1960s period fertility rates for birth orders 3 and higher were as high as 2.0 children per woman in Hong Kong, 2.4 in Singapore and 3.1 in Thailand. Currently, period fertility rates for birth orders 3 and higher range from 0.1 children per woman in Hong Kong (one of the lowest levels in the world) to 0.3 children per woman in Singapore and Thailand, which is within the range of most European countries and much lower than in Iceland, Ireland and the United States (0.5-0.6 children per woman).

Childlessness is a rare phenomenon in China, Korea, Singapore and Thailand; its incidence was somewhat higher (and similar to that in the European countries) among women born at the turn of the century in Japan and Hong Kong (Figure 8), but it decreased in the subsequent cohorts up to those born in the 1930s. Since then it is increasing in Hong Kong and Singapore. Anyway, the current incidence of childlessness in the region is still low (and similar to that in the former Soviet Union) and its role in the fertility decline was minor or nil.

Fertility transition resulted in dramatic changes in the structure of female cohorts by the number of children ever born (Table 4). In the last pre-transitional cohorts, from 5 to 9 per cent of ever-married women had one child, from 5 to 11 per cent had two children and from 74 per cent (Japan and Hong Kong) to 81-88 per cent (China, Thailand and Singapore) had three children or more. Among ever-married women born from the early 1940s to the early 1950s, from 5 per cent (Thailand) to 18 per cent (China) had one child, from 26 per cent (Hong Kong) to 50 per cent (Korea) had two children, and from 30 per cent (Japan) to 80 per cent (Thailand) had three children or more. Thus, there were striking decreases of the proportions of large families in all ESEA countries save Thailand where 80 per cent of women born in 1941-1945 - the last cohort for which data are available — had more than two children.

However, the cohorts that have completed child-bearing most recently are characterized by substantial structural differences across ESEA countries. These differences may result from three factors: (a) the compared cohorts lived through different stages of fertility transition (e.g., in Thailand the cohort born in 1941-45 -the last for which the data are available - experienced only the beginning of the transition); (b) there were country-specific features of the transition (such as one-child population policy in China); and (c) the reference periods of

the most recent estimates are 10 years apart (1980 and 1981 censuses in Thailand and Hong Kong as opposed to 1990 censuses in China, Korea and Singapore).

1-5. Decomposition analysis of fertility decline

It has been already mentioned that in ESEA countries or areas fertility transition was brought about by the decline in marital fertility as well as by the postponement of marriage and that fertility decline below replacement level seemed to be caused mainly by the postponement of marriage. But can we measure to what extent these two demographic factors are related to TFR decline in both the period of fertility transition and the period of below replacement fertility? For clarifying the relative effect of the change in proportion currently married and the change in marital fertility, decomposition method by Cho and Retherford has been applied to the TFR decline in both periods for seven countries and areas (Cho et al., 1973). Unlike the European countries where cohabitation and extra-marital births have increased considerably since the 1960s, decomposition analysis is still very effective for analyzing TFR changes in ESEA countries where cohabitation is rare and extra-marital births are exceptional. The results are shown in Table 5.

According to Table 5, for the period of fertility transition, the decline of marital fertility was the major factor for the TFR decline, but the decline of the proportion married (or the postponement of marriage) contributed to it to a certain extent in ESEA countries or areas, except Thailand and China where the effect of marriage change was negligible or rather fertility-raising. In contrast, for the period of below replacement fertility, the change of marital fertility was rather positive (in Japan, Singapore and Korea) or negligible (in Taiwan) and the decline of the proportion married (or the postponement of marriage) was the sole determinant of the TFR decline, except Hong Kong where the two factors were equally responsible for the TFR decline.

2. Social and Economic Background of Fertility Decline

2-1. Modernization and family planning programs

According to demographic transition theories and the more recent economic theories of fertility, fertility transition is brought about by the decline of the “demand” for children due to economic and social development

accompanying economic growth, the so-called effect of modernization (Notestein, 1945; Leibenstein, 1957; Bulatao et al., 1983). Economic and social development, it was hypothesized had to reach a certain threshold (United Nations, 1965) before fertility would start to decline. On the other hand, most governments of developing countries have, more or less, intervened to influence fertility trends in the postwar years by family planning programs, through which the conditions of the “supply” of children have been changed so as to reduce unwanted births (Easterlin, 1985).

At the onset of the fertility transition in the six ESEA countries, indicators of socio-economic development were similar for some but quite diverse for others. In the six countries, fertility started to decline at 1000 to 1500 US dollars of GDP per capita (1985 basis) except China (at 700 US dollars) (Figure 9) and at almost 100 percent level of primary school enrollment ratios and, though the data are limited, at similar levels of secondary school enrollment ratios. However, the degree of urbanization ranged from 15 percent (Thailand) to 100 percent (Singapore), and infant mortality and life expectancy ranged from 32 per thousand births (Singapore) to 166 (Japan) and 42 years (Japan) to 66 years (Hong Kong) respectively. The data on industrialization are limited, but the proportion of workers engaged in primary industry presumably varied considerably at the onset of transition among these countries from less than 10 percent in the two city-nations of Singapore and Hong Kong to around 80 percent in China. Judging from those data, while we could say that fertility transition started at certain levels of living and with the universality of the primary education, we do not find any such thresholds for other indicators of development in ESEA.

Although the timing of fertility transition and the level of development at which transition occurred differed among six countries in ESEA, economic growth and its accompanying social changes continued in the period of fertility transition. GDP per capita increased between the year of the onset and the end of fertility transition by 2.7 times for Japan, by 4.3 times for Korea, by 3.3 times for Hong Kong, by 3.2 times for Singapore (Figure 9). It increased also for China and Thailand by 1.9 times and 1.6 times respectively. The level of industrialization and urbanization became higher in those countries in ESEA except the two city-nations where urbanization had reached the maximum, IMR declined and life expectancy lengthened and enrollment ratios for second-

ary school rose in all of them.

By the end of transition, GDP per capita had increased by over 2500 US dollars save China (1300 US dollars), IMR decreased to below 50, between 48 (China) and 12 (Singapore), and life expectancy reached around 70 years, between 68 (Japan) and 75 (Hong Kong). From this we could say that the conspicuous rise in survival rates of children was a necessary condition for fertility transition in ESEA. The proportion of non-agrarian workers and city-dwellers increased in four countries in ESEA. Whereas Japan and Korea was transformed into an urban, industrial society (two thirds became non-agrarian workers and urban dwellers), China and Thailand still remained a rural agrarian society when they completed their transitions (two third remained agrarian workers and rural dwellers) (Table 6).

Did the social and economic developments described above change the demand for children in ESEA? As for Japan, there had been scarce data on family size preference in the prewar and in the postwar transition periods. According to a series of surveys on family planning which were undertaken between 1950 and 1967 covering postwar transition period, the proportion of married women aged less than 50 responding negatively to the question "Do you rely your sons or daughters for your living for your old ages?" increased from 18 percent to 48 percent, which might imply the decline in demand for children (PPRC, 2000). In Japan, there has been little change in the mean ideal number of children at around 2.6, with three children as the majority, nor in the total intended number of children at around 2.2, with two children as the majority, since 1977 when the data were available for the first time (NIPSSR, 1998a).

In some other countries or areas in ESEA, there were series of surveys on family size preference during the period of their fertility transition. Those surveys showed that the total desired number of children declined from 4.0 (in 1965) to 2.6 (in 1985) in Taiwan (Freedman et al., 1994), from 3.9 (in 1967) to 2.0 (in 1985) in Korea (Gendell, 1989) and from 2.8 (in 1975) to 2.0 (in 1987) in Thailand (Knodel et al., 1989). The mean ideal number of children also decreased from 3.9 (1967) to 2.0 (1985) in Korea and from 3.8 (in 1972/73) to 2.7 (in 1987) in Thailand. These data suggest that the demand for children clearly declined in ESEA in the period of transition because of economic growth accompanied, especially, by the expansion of educational opportunities and the improvement of children's health.

The Japanese government only indirectly contributed to the prevalence of family planning during the transition period. In the prewar period the pro-natalist government banned induced abortion very strictly and intervened sometimes against the birth control movement by non-governmental organizations and activists (Kubo, 1997). The postwar rapid transition was brought about directly by the increase of induced abortion that became easier to have by its legalization in 1948 and the successive revisions of its law which were proposed by some parliamentarians. The government started to support family planning initiatives by NGOs in the late 1950s partly for the purpose of reducing induced abortion.

As for Hong Kong, although the government had not been directly involved in family planning programs, the activities of such NGOs as the Family Planning Association had continued since the 1950s. Its activities have contributed much to the prevalence of modern contraceptives (Chan, 1976; Wat et al., 1972).

In the other five countries or areas in ESEA, contraceptive practice prevailed through strong family planning programs under anti-natalist policies of their governments. The years when the governments of Singapore, Taiwan and Korea began family planning programs were in 1966, 1964 and 1962 (Palen, 1986; Freedman, et al., 1994; Cho, 2000) but fertility had already started to decline before those years. Because of this fact we might say that fertility transition occurred in these three countries or areas without their governments' intervention, if only very gradually, but their strong family planning programs, together with some incentive-disincentive programs, were conducive to accelerating fertility decline through directly affecting marital fertility.

It was in 1973 and 1970 that the governments of China and Thailand began their family planning programs respectively (Jiang et al., 2000; Guest et al., 1996). Although their policy stances are evaluated to be in contrast, a directive one in China and a voluntary one in Thailand, they have in common the fact that fertility would not have declined as fast given their levels of development, unless their governments had undertaken such strong family planning programs.

Contraceptive prevalence were at very high levels, from 68 percent in Thailand to 83 percent in China (among the highest in the world), by the completion of fertility transition, in all the countries or areas in ESEA, except Japan, where prevalence was a little more than 40 percent in 1959 (PPRC, 2000). The effectiveness of con-

trapection is estimated to be very high in these six countries or areas because the share of modern contraceptive methods such as sterilization, the pill and injection, and IUD made up 59 percent of total use in Singapore to 97 percent in China (United Nations, 1999). Japan was again the exception in her disproportionately greater use of the condom and the rhythm method (Table 7).

In addition to the use of the modern contraceptive methods, there has been high possibility that induced abortion contributed to fertility reduction in these countries or areas, let alone Japan, since its use as a fertility regulation method was accepted tolerantly there even if it was not legalized for the birth control purposes (Muramatsu, 1971; Gendell, 1989).

In sum, in the countries or areas in ESEA, almost all married couples could achieve the number of children they wanted to have or, in other words, they could avoid any unwanted births by the end of transition because of the universal prevalence of effective means of contraception and the easy availability of abortion. Its important implication for the subsequent period is that the main determinant of fertility became the timing and frequency of marriage and family size preference among married couples.

2-2. Women's emancipation and below replacement fertility

As was seen before, the mean number of children ever born for completed families has changed little since it had decreased to just more than two children and family size preference has held at just more than two children on average in these countries in ESEA. The reason TFR declined and remained below replacement level in at least five countries or areas in spite of this fact was the conspicuous rise in the proportion single in the prime reproductive ages, accompanied by the postponement of marriage and childbearing. What has brought about such a large change in marriage behavior in ESEA?

As for social and economic background of fertility decline below replacement level since the 1970s in the Western societies, there have been several viewpoints (Westoff, 1977 and 1983; Davis et al., 1987):

- (1) The decrease in un-timed or unwanted births due to the prevalence of modern contraceptive methods and the legalization of induced abortion.
- (2) A dramatic change in marital behavior such as the increase in cohabitation, extra-marital births and divorce, together with ideational changes.

- (3) Decreasing children's utility and increasing childcare cost in a highly industrialized and urbanized society.

- (4) The increasing difficulties of combining work and childcare or increasing in opportunity cost of childcare due to increased women's labor force participation.

How are these viewpoints applicable to the case of below replacements fertility in ESEA? First, unlike the Western societies, changes in fertility control behavior were conspicuous in the first fertility transition in ESEA. The use of effective modern contraceptives reached almost saturation levels during that period in ESEA save Japan, so that further changes in contraceptive prevalence have been limited as is seen Table 7. Thus, the level of unwanted births became so low that changes in the timing of marriage and childbearing have come to be the most important factor affecting the trend in the period TFR. It is often said that "the pill liberated women" in the Western societies or, in other words, the easy availability of the modern female-oriented contraceptives helped to promote changes in women's social and economic role and status (Ermish, 1991). It remains to be seen whether this hypothesis is applicable to situations in ESEA.

Second, cohabitation and extra-marital fertility have hardly increased in ESEA: For example, in Japan only 1.7 % of unmarried women aged 18 to 34 reported to be currently cohabiting in the 1997 survey (NIPSSR, 1998b) and the share of extra-marital births has increased by only a fraction, from 0.8 percent of all births in 1975 to 1.6 percent in 1999. The latter figures are 2.7 percent in Korea in 1983 and 5.9 percent in Hong Kong in 1998, which are somewhat higher than those in Japan but much lower than those in the Western societies. These facts imply that marriage institution is still robust in ESEA. But the divorce rate has been increasing continuously in all these countries during this period, like in the West. Between 1985 and 1998 the divorce rate increased from 1.39 to 1.94 in Japan, from 0.79 to 1.96 in Hong Kong, from 0.91 to 2.12 in Korea and from 0.82 to 1.39 in Singapore.

Some have asserted that in the Western countries there was ideational changes, such as from materialism to post-materialism or secularization and individualism (Lesthaeghe et al., 1988; Van de Kaa, 1987), which brought about changes in reproductive norms and values and in a revolution in marriage, but there has been only scant evidence showing such ideational changes in ESEA,

so far. For example, a series of opinion surveys in Japan showed that there had been only slightly weakening of religious mind and only a slight shift of value system from collectivism to individualism in this post-transitional period (Atoh, 1997b).

Third, all the ESEA countries have, indeed, experienced rising levels of living, industrialization (e.g. an increasing share of work force in the secondary and tertiary industry) and an increasing proportion of employees in this period, but we cannot say that these changes have entirely reduced children's utility for their parents. In all these countries or areas in ESEA except Japan, economic necessities of having children seem to be still strong because their social security system has not been fully developed and levels of personal assets are not enough for the general public. The robustness of two-children family norm and the strength of son preference in some of these countries (Park et al., 1995) seem to support this argument. In Japan, indeed, "investment values" of children for parents, e.g. "economically depending upon children in old ages", have been depreciated continuously in the postwar years and the central value of children for parents became their "consumption value, e.g. "having a cheerful home with children" (Atoh, 1996). But children's value as providers of physical care in parents' old ages is still regarded as important.

On the other hand, it cannot be denied that the cost of childcare has increased in ESEA like in the Western societies. The rise in college enrollment ratios in all these countries in ESEA reflect not only the societal need for expanding a highly qualified labor force of these countries but also the rising aspiration of parents for their children to climb the social ladder, and it has clearly raised education cost of children, including economic and psychological costs, for their parents. In Japan, the overwhelming majority of married women in the prime reproductive ages said that the main burden of bringing up children was the economic cost of children and psychological stress caused by socialization and education of children (Atoh, 1996).

The above three factors may have been, at least indirectly, related to fertility decline below replacement level in ESEA, but the most direct and important factor is the fourth one, that is women's emancipation.

It goes without saying that in the period of fertility transition, girls as well as boys came to receive more years of education and were more likely to be engaged in employed work during the period of fertility transition in

all the ESEA countries, which was conducive to rising proportion single and marriage delay. Also in this period, more and more women have entered into the secondary or higher education and taken jobs in the secondary and tertiary industries, in at least four countries in ESEA.

First of all, the secondary school enrollment ratios increased, for both boys and girls. Ratios have reached almost 100 in Japan and Korea in 1996, about 70 in Hong Kong and Singapore since 1990. The tertiary school enrollment ratios also increased both for men and women (Table 8). Although this ratio for women was below 20 in Japan and below 10 in three other countries in 1980 or before, it increased to over 40 in Japan and over 30 in three other countries in 1996. Furthermore, the relative gender gap in enrollment ratios shrank for all four countries (It even reversed in Japan if two-year colleges were included).

In Japan, the share of females among four-year college graduates increased, with more women choosing fields of study such as social sciences, natural sciences, or engineering rather than literature, education, arts and home economics. The latter implies that a college diploma for women became an instrument for furthering their occupational career in raising their wage potential rather than as a good passport for a happy mate selection (Atoh, 1992).

Higher education for women is clearly connected with the postponement of marriage and in some cases with higher celibacy rates. In Japan, data for 1980 and 1990 show that more female college graduates tend to be single at all ages compared with females with less education, in contrast with the fact that fewer male college graduates are single at all ages compared with their less educated counterparts (Table 9). Similar patterns are observed for Singapore (Table 10) and Taiwan (Freedman et al., 1994) in data for 1990. Celibacy rates were also high for female college graduates. The proportion of female college graduates who were single at age 40-44 in 1990 was 10 percent in Japan, 24 percent in Singapore and about 18 percent in Taiwan.

Secondly, more women came to be engaged in employed work in countries in ESEA. In the period of below-replacement fertility, women's labor force participation (WLFPR) increased for almost all age groups in the four countries in ESEA (Figure 10~14). The exception is 15-24 age categories: WLFPR decreased considerably for these ages, because the prolonged education

needed for employment in the modern sector necessitated the postponement of entry into the labor market.

Despite increases in labor force participation in childbearing ages, all these countries in ESEA save Thailand show a dip in WLFPR just after the peak childbearing age group, a pattern evident in many of the more developed countries. In these countries many women tend to quit their jobs at the time they are needed for childcare. When the children get older, women may or may not re-enter the labor force. In the four countries in ESEA, male and female participation rates are about equal until the age 25, after which the rates for females drop off whereas those of males continue to increase. Among these four, the levels of WLFPR at the age 30-34 in Japan, Korea and Hong Kong in the 1990s are lower, about 50 percent, than those in Singapore, about 70 percent, which are close to their male participation rates.

Thirdly, the proportion of working women in professional and technical occupations is increasing, reflecting rising college enrollment ratios. For example, in Japan it increased from 6.7 percent in 1975 to 14.3 percent in 1995. Related to this, the wage differentials between men and women shrank. Wage ratio of female to 100 male workers aged 25 to 29 in Japan increased from 67.7 in 1975 to 84.9 in 2000 (Atoh, 1999). The similar changes were observed for Singapore and Taiwan (Cheung, 1990; Chi, 1992)

Fourthly, women's emancipation was encouraged by various UN international conferences or conventions on women's issues, such as the Convention for Abolishing all Forms of Discrimination against Women. For example, in Japan this convention was ratified in 1985, after when Equal Employment Opportunity Law took effect in 1986. The law prohibited employees to discriminate against women in terms of employment, promotion and wages, which were potentially conducive to women's employment, especially the employment of four-year college graduates.

Increasing female college graduates (and the shrinking gender gap among graduates), more and longer female participation in labor market, increasing female workers in professional or technical jobs with higher income and prestige, shrinking wage differentials by gender and the legal protection of gender equality in employment field, all led to changes in women's social and economic achievements and status and thereby contributed to the decreasing merit of married life for women and the postponement of marriage and childbearing in

ESEA. These developments also increased the difficulties combining work and childcare, which may have also led to the lowering of the attraction of married life.

2-3. Family, Gender Equality and Fertility

Modernization has continued after fertility transition in ESEA: GDP per capita reached over 10,000 US dollars in Japan, Hong Kong and Singapore (and probably in Taiwan) in the 1980s and in Korea in the 1990s. These five countries and areas have become affluent, fully industrialized and urbanized societies. The other two countries, Thailand and China remain, by and large, agrarian and rural societies, though they are modernizing very rapidly. In addition, women's emancipation progressed during and after the transition. More and more women are college graduates, more work outside their home and wage differentials by gender have decreased.

These changes are wholly similar to those that happened in the Western societies since the 1960s. The issue then, is why do more educated and working women in ESEA stay single longer and why do young people in ESEA scarcely dare to cohabit and have extra-marital births like their counterparts in the West? In order to answer those questions we examine the traditional family system and women's role and status in it.

All the countries and areas in ESEA studied in this paper had, traditionally, a patrilineal and patrilocal family system, except Thailand that was characterized by more flexibility in lineage and residence. Among the six countries or areas only Japan and Korea had the stem family system and the other four, the joint family system. Under this system, either the stem or the joint, the male head of the patrilineal family controlled all the family properties and was generally the sole provider of economic support. An important concern of the traditional family group was the begetting of a male heir to maintain the continuation of the family lineage, to inherit the family property, and to perform ancestral rituals in the household and at the family grave. A woman, up on marriage, had to leave her parental home and move to her husband's house (Pak, 1998). Under this system sons tended to be obedient to their fathers and wives were expected to be obedient to their husbands as well as their father or mother-in-law. Such patriarchal system was legitimized by Confucianism that was cultural heritage of these societies.

The family system is not invariable. As these countries or areas have modernized with continuous, rapid eco-

conomic growth, the family system has but changed gradually. However, in the period when fertility transition occurred, the traditional family system was still dominant. For example, in 1960 just after the end of fertility transition in Japan, the rate of newly-wed couples living with their parents (mostly the husband's) was about 60 percent and the percentage of elderly aged 65 or over co-resident with the sons or daughters was 87 percent (Atoh, 1997a). Similarly the percentage co-resident of newly-weds with their parents in Taiwan was still 67 percent in 1985 just after the transition, though it had declined from 92 percent in 1958 (Chi, 1992). The proportion co-resident must have been similarly high in Singapore and Hong Kong at the end of the 1970s when they completed their fertility transition, though the data are limited.

The assertion that the extended family is connected with high fertility (Davis et al., 1956) does not hold for the cases of the countries in ESEA where there is evidence that the extended family type could coexist with the small family accompanied by fertility transition (Freedman et al., 1994;).

Can the traditional, extended family coexist with the replacement fertility in a modernized society where women are more emancipated? In all the countries or areas in ESEA except the two city-nations, more and more young people have left their parental home and migrated from rural areas to urban centers where job opportunities are abundant. They established nuclear-family households when they got married in cities. Parents' households were nucleated after all their sons and daughters left. For example, in Japan the co-residence rate of newly-weds with their parents decreased by up to about 30 percent in the 1970s and then stabilized and the co-residence rate of the elderly with their children continued to decrease by one percent per year to 56 percent in 1995 (Atoh, 1997a). The proportion of the sum of nuclear family households and single households among the total number of households increased from 65 percent in 1960 to 84 percent in 1995 (Atoh, 2000a). Similar increases occurred in Korea; from 72 percent in 1970 to 80 percent in 1995 (Pak, 1998) and probably in Taiwan and Hong Kong. In the latter cases decreasing proportion of joint family types was accompanied first by increasing stem family types but eventually led to increasing nuclear family types (Chi, 1992; Wong, 1975).

Thus, indeed, families were nucleated in terms of the household type. But does this mean "the emotional nucleation of families" (Caldwell, 1982), too? For in-

stance, in Japan, it is true that the feeling of filial obligation has weakened, but still about half of married women aged 50 responded positively the general idea that sons or daughters should take care of their parents (PPRC, 2000). The weakness of emotional nucleation in Korea, China and Taiwan is reflected in the persistence of son preference in these countries (Park et al., 1995; Zeng, 1997). The sex ratio at birth, normally about 105, started to rise in these three countries or areas around 1985, reaching 117 in Korea, 114 in China and 112 in Taiwan around 1990. The ratios were even higher for births of higher parity. Such a recent rise in the sex ratio at birth may be interpreted as a reflection of desperate efforts by those who want to secure boys for maintaining their family lineage with a newly available technique under conditions of the national demand for limiting family size. It is also a reflection of the persistence of the traditional family there.

Secondly, industrialization and urbanization promoted the separation of home and work place, but only as long as such sex role division of husband as breadwinner and wife as homemaker continued was the traditional family system compatible with replacement fertility (two-children family) and parental care. As women have become more educated and more engaged in jobs out of home, however, ideational changes related to women's social and familial roles have occurred.

For example, in Japan, attitudes toward women's roles changed dramatically. A series of opinion surveys showed that the proportion of respondents, for twenty years between the middle of the 1970s and the middle of the 1990s, agreeing with the opinion that women should get married decreased from around 80 percent to about 40 percent both for men and women and that those supporting the opinion "Men work outside, and women keep home" decreased also from more than 80 percent for both men and women to 66 percent for men and to 56 percent for women. On the other hand, those agreeing that women should continue their job after their marriage and child-bearing increased from 12 percent to 26 percent (Atoh, 1997b). Those women who are more educated, who are living in urban areas and who have jobs of higher prestige are more likely to support women's emancipation (Kaneko, 1993).

A survey conducted in Korea revealed that those agreeing with the opinion "women should be involved in housekeeping only" decreased from 25.7 percent for men and 17.0 percent for women to 19.6 for men and 12.1 for

women between 1991 and 1995, and instead those who believed that women should work before marriage and after maturity of children increased from 20-25 percent to about one third (Pak, 1998).

Despite Japanese women's greater involvement in work out of the home and their attitudinal change toward egalitarianism by gender, men's family role has not changed significantly in those twenty years. According to a series of time-use surveys, the average time husbands spent for family matters increased only modestly from 6 minutes to 13 minutes on weekdays and from 34 minutes to 56 minutes on Sundays between 1981 and 1996. They also showed that working wives were always involved in both work and family matters for longer hours than working husbands on weekdays as well as on Sundays (Atoh, 2000a).

In this situation, more educated and more professional women would feel frustrated with such wife's roles as submission to husbands and taking care of husband's parents as well as household chores and childcare that are expected in the traditional family system. At the same time, in an employee-centered society with the tendency of the nucleation of households, working wives find it more difficult to combine their work and family duties they are assigned.

To cope with such issues related to working wives or working mothers, several measures or strategies have been taken, explicitly or implicitly in ESEA countries.

The first strategy is the Japanese type reflected in the M-shaped age profile of women's labor force participation rates: that wives quit their jobs after marriage or the first birth and resume them usually after children reached school age. The biggest problem with this strategy from women's point of view is that longer interruption of occupational career means less accumulation of human capital. Furthermore, new jobs are often limited to part-time jobs with low wage levels in such a society as in Japan where lifetime employment is prevalent. In this situation the opportunity cost of childbearing becomes very high (EPA, 1998). From the macro point of view, under this Japanese type strategy women's labor supply, especially in the prime childbearing age, tends to be limited.

The Korean type strategy is different from the Japanese one in that Korean women after quitting their jobs at the time of marriage or the first birth are less likely to return to the labor market. As part-time jobs are strictly limited in Korean labor market, wives wanting to take

jobs face a dilemma, taking either no work or a full-time job with long working hours (Tsuya, 2000). This strategy seems to have the same but larger problems than the Japanese one.

The second strategy is the Taiwanese one in which, while young working couples fulfill their traditional filial duty by co-living with husband's parents during the early stage of married life, they can have help for childcare and household chores from non-working mother-in-laws and save money for acquiring their own house in the future (Chi et al., 1996). The problem with this strategy is that they cannot necessarily find jobs in their parents' location and this strategy for childcare is impossible if mother-in laws work out of home themselves (Freedman et al., 1994).

The third strategy is one which is popular in Singapore (and probably in Hong Kong) that co-working young couples, either living with their parents or not, hire maids for household chores and childcare (Cheung, 1990). In order for this strategy to have general applicability, the labor cost of maids should be relatively cheap. But in highly developed countries that have completed their fertility transition, the supply of domestic labor becomes severely limited and expensive without cheap foreign labor. The employment of foreign maids may not be an easy option for every country because of language and cultural barriers.

The fourth strategy is the utilization of maternity and parental leave and public or private childcare facilities. The availability, of course, depends upon the efforts taken by governments and private companies. In most of the countries or areas in ESEA, and especially in the 1990s in Japan, governments have made efforts to strengthen family policies for coordinating the work-family dilemma, but those efforts are not sufficient yet (Atoh, 2000a; Atoh, 2000b; Cheung, 1990).

The above strategies may have contributed to solve the work-family dilemma to a certain extent. But the fact that the proportion single has been increasing in the prime childbearing ages, especially among more educated women, in at least five countries or areas in ESEA, shows that those strategies have not fully met the needs of these women. There seems to be another factor which has made women hesitant to get married and, as a result, hindered compatibility of work and family, which is the patriarchal nature of gender relationships originating from the traditional family system and Confucianism.

This factor, the persistence of the patriarchal gen-

der relationship, may also explain partly why there has been a very low incidence of cohabitation and extra-marital births in ESEA. Cohabitation is, on principle, based upon free decisions by equal partners, therefore it cannot be prevalent in a society with a patriarchal gender relationship because women may suffer from the limitation of their free decisions, e.g. having a baby or not, more than men even in a cohabiting union. Another reason why very few women choose to cohabit is also related to the traditional family norm. For instance, about 85 percent of working, single women aged 20-34 in Japan live at their parent's home (Atoh, 1998). Some Japanese sociologists call these young people "parasite singles" in a sense that they enjoy higher levels of living with their parents' support (Yamada, 1999). But their behavior may seem to be derived from the advantages of the parents-child relationship over the conjugal relationship in the traditional extended family system or, in other words, the weakness of individualism derived from the emotional nucleation of the family. The similar phenomenon is observed in Singapore, but is interpreted in a different way. There, the unmarried daughters have displaced the married sons in the right to share the parental home, waiving married son's obligation to live with the parents. As a result, the unmarried daughters came to have to bear a grater burden in the care of the parents, substituting the role traditionally performed by daughters-in-law (Cheung, 1990).

Concluding Remarks

Below replacement fertility is not limited to the Western societies. In East and South-east Asia there are seven countries and areas that had already completed fertility transition to the replacement level. They are Japan, Singapore, Hong Kong, Korea, Taiwan, Thailand and China. More countries in ESEA are sure to follow them in the near future. Among the seven, fertility of the first five continued to decline or stayed much below the replacement level already for 10 to 25 years. In this paper the demographic, social and economic determinants of fertility trends in these countries and areas have been examined. We would like to conclude our paper by briefly discussing the future of fertility in ESEA. In order to discuss about the prospects of fertility, we need to take into consideration at least three factors: The relationship between the period and cohort fertility, the effect of policy intervention and cultural background.

First, fertility decline below replacement level has occurred in ESEA almost entirely due to the rise in the proportion single, implying the postponement of marriage. Since cohabitation and extra-marital births has hardly increased in ESEA, the postponement of marriage has led directly to the delaying of childbearing. Based on this observation, some have argued that the period TFR underestimates the potential of the cohort completed fertility because at least some portion of delayed births will be recuperated at the later stage of women's life course, usually at age 30s. The idea of "catching-up" has been supported by the experiences in the 1980's in some of the Western countries. It has also been strengthened by the application of new measures of TFR, such as TFR based on parity progression ratios or TFR adjusted by the tempo effect, to some of ESEA countries or areas (Feeney, 1986, 1987 and 1981; Sweet, 1996).

Indeed, the catching up of fertility at the later stage due to "the aging of fertility" is occurring in Japan, Korea, and Singapore, but it was so limited and so modest that it could not compensate for fertility decline at the earlier stage of reproductive life, usually at age 20s, in these countries. Also, the decline in fertility at earlier stage has went on steadily in ESEA because of the ever-rising proportion single at the age 20s and even at age 30s at least in Japan and Singapore. Nobody can predict to what level the increase of the proportion single will reach. But we may have to envisage the coming of the same society in the future of these countries and areas in ESEA as the pre-transitional Western European societies with the late and non-universal marriage system, though its causes may be totally different between them.

Secondly, the governments of the five countries or areas in ESEA have changed their policies on population since their fertility plunged into below replacement level. Singapore changed the position by 180 degrees, from anti-natalist to pro-natalist, in 1984 (Palen, 1986; Yap, 2000), Taiwan aimed at the resumption of replacement level fertility in 1992 (Freedman et al., 1994). Although the government of Japan never stated any pro-natalist position, it started to strengthen family policies in 1990 (Atoh, 2000a). Korea and Thailand stopped fertility policy in 1996 and 1997 respectively. Only the government of China is keeping the strongest anti-natalist position (Jiang et al., 2000). As was well documented, the strong programs based on the pro-natalist policy in Singapore had some positive effect on fertility: After TFR hit the record-low 1.45 in 1985, it recovered somewhat

and stayed at the around levels of 1.70 since then (Yap, 2000). Thus from the case of Singapore we could say that fertility policies have some effect on actual fertility trends but that even with such strong programs as the government of Singapore took fertility would stay much below replacement level. With softer policies, fertility in Japan and Taiwan seems to resist the resumption.

Thirdly, the traditional family system was, unexpectedly, able to coexist with fertility transition to the replacement level in ESEA. The system has been changing gradually, especially in the household type, but the change in mentality of the patrilineal extended family system, strengthened by Confucianism, has been more gradual than the speed of changes in the household type. Can the system coexist with replacement level fertility in the age of women's emancipation? Some strategies have been taken to coordinate family roles in the traditional system to women's rising aspirations in social and economic life, but the trends of the postponement of marriage and childbearing seem to have not changed. Some argue that the traditional family system is a component that is rather favorable to fertility. The persistence of the two-child family norm and the strength of son preference in some countries or areas is regarded as the evidence for it (Freedman et al., 1994; Park et al., 1995). But this factor seems to work only among married couples, so that its effect on TFR is limited. The decisive factor for fertility in the future in ESEA is not marital fertility but marriage or partnership formation. The traditional family system seems to be a component that is rather unfavorable to partnership formation in the age of women's emancipation, since it has such emotional connotation as women's obedience to men and the predominance of parent-child relationship over conjugal relationship. The trend that more and more women stay longer at their parent's home at least in Japan and Singapore, either as "parasite singles" or as "surrogates of the male heir", may reflect the difficulties of changing the nature of gender relationship derived from the traditional family system.

References

- Atoh, Makoto, 1992. "The Recent Fertility Decline in Japan: Changes in Women's Roles and Status and Their Policy Implication", in Population Problems Research Council (PPRC). *The Population and Society in Post-war Japan*. PPRC-The Mainichi Shimbun, pp. 51-72.
- Atoh, Makoto, 1996. "The Direction of Changes in Japanese Families in terms of Paren-Child Relationship", in PPRC, *Toward a New Century of Equality and Symbiosis: The Report on the 23rd National Survey on Family Planning*, PPRC-The Mainichi Shimbun, pp. 89-114.
- Atoh, Makoto, 1997a. "Demographic Changes and Family Changes", in Atoh, Makoto et al.(eds.), *Population Change and the Family*, Taimeido, Tokyo, pp. 1-24. (Japanese)
- Atoh, Makoto, 1997b. "Very Low Fertility in Japan and Value Change Hypotheses", *Jinkou Mondai Kenkyu (Journal of Population Problems)*, 53-1, pp. 3-20.
- Atoh, Makoto, 1998. "Traditional Family Values of Unmarried Women-in Relevance to the Phenomenal Rise in the Proportion Never Married." PPRC. The Mainichi Shimbun., pp. 117-150.
- Atoh, Makoto, 1999. "The Current State of Gender Statistics-in Relation to Population Issues", in Kamata, Toshiko et al. (eds.). *Lectures in Sociology 14: Gender*, Tokyo University Press, pp. 109-150.(Japanese)
- Atoh, Makoto, 2000a. *The Contemporary Demography*, Nihon Hyoronsha, Tokyo. (Japanese)
- Atoh, Makoto, 2000b. "Social Policies in Low-Fertility and Rapidly Aging Societies-the Case of Japan", in Bernd von Maydell et al. (eds.), *Studies of Social Security System in Japan and Europe*, Duncker and Humbolt, Berlin, pp. 75-94.
- Bongaarts, John. et al., 1998. "On the Quantum and Tempo of Fertility" *Population and Development Review* 24-2, pp. 271-292.
- Bulatao, Rudolf A., 1983. *Determinants of Fertility in Developing Countries*, Vols. 1 and 2, Academic Press. New York.
- Caldwell, John C., 1982. *Theory of Fertility Decline*, Academic Press.
- Chan, K.C., 1976. "The Role of the Family Planning Association in Hong Kong's Fertility Decline," *Studies in Family Planning*, 7-10, pp. 284-289.
- Cheung, Paul P.L., 1990. "Micro-consequences of Low Fertility in Singapore", *Asia-Pacific Population Journal*, 5-4, pp. 35-46.
- Chi, Peter S.K., 1992. "Economic Development, Women's Status, and Changing Family Structure in Taiwan", C.Goldscheider (ed.) *Fertility Transitions, Family Structure, & Population Policy*, Westview Press, pp. 157-174.
- Chi, Peter S.K. et al., 1996. "Family Structure and Fertil-

- ity Behavior in Taiwan,” *Population Research and Policy Review*, 15, pp. 327-339.
- Cho, Lee-Jay and D.Retherford, 1973. “Comparative Analysis of Recent Fertility Trends in East Asia”, *Proceedings of the 17th General Conference of the IUSSP*, IUSSP, Liege.
- Cho, Namhoon, 2000. “Policy Responses to Population Ageing and Population Decline in Korea”, Paper presented at the Expert Group Meeting on Policy Responses to Population Ageing and Population Decline, undertaken by UN Population Division, in New York between 16-18 October.
- Cleland, John, 1996. “A Regional Review of Fertility Trends in Developing Countries: 1960 to 1995”, W. Lutz (ed.), *The Future Population of the World* (rev. ed.), IIASA, pp. 47-72.
- Coale, Ansly, J., 1969. “The Decline of Fertility in Europe from the French Revolution to World War II”, S.J. Behrman et al.(eds.), *Fertility and Family Planning: A World View*, University of Michigan Press.
- Coale, Ansly, J. et al., 1986. *The Decline of Fertility in Europe*, Princeton University Press.
- Council of Europe, 1999. *Recent Demographic Development in Europe*.
- Davis, Kingsley and J. Blake, 1956. “Social Structure and Fertility: An Analytic Framework”, *Economic Development and Cultural Change*, 4, pp. 211-235.
- Davis, Kingsley et al.(eds.), 1987. *Below-Replacement Fertility in Industrial Societies: Causes, Consequences, Policies*, The Population Council.
- Easterlin, Richard and E.M. Crimmins, 1985. *The Fertility Revolution: A Supply-Demand Analysis*, University of Chicago Press, Chicago.
- Economic Planning Agency (EPA), 1998. *The 1997 White Paper on People’s Economic Life: Working Women, Pursuing a New Social System*, Tokyo.
- Ermish, John, 1991. “Women’s Economic Activity and Fertility in the United Kingdom”, CEC, *Study on the Relationship between Female Activity and Fertility, Vol.2, National Reports*, Eurostat, pp. 175-225.
- Feeney, Griffith and Jingyuan Yu, 1987. “Period Parity Progression Measures of Fertility in China”, *Population Studies*, 41, pp. 77-102.
- Feeney, Griffith, 1991. “Fertility Decline in Taiwan: A Study Using Parity Progression Ratios”, *Demography*, 28-3, pp. 467-479.
- Feeney, Griffith, 1996. “Fertility Decline in Taiwan: A Study Using Parity Progression Ratios”, *NUPRI Research No.35*. Tokyo: Nihon University Population Research Institute.
- Freedman, Ronald et al., 1994. “Taiwan’s Transition from High Fertility to Below-replacement Levels,” *Studies in Family Planning*, 25-6, pp. 317-331.
- Gendell, Murray, 1989. “Stalls in the Fertility Decline in Costa Rica and South Korea”, *International Family Planning Perspectives*, 15-1, pp. 15-21.
- Guest, Philip and G.W. Jones, 1996. “Policy Options when Population Growth Slows: The Case of Thailand”, *Population Research and Policy Review* 15, pp. 109-130.
- Hajnal, John, 1965. “European Marriage Patterns in Perspective”, D.V. Glass et al. (eds.), *Population in History: Essays in Historical Demography*, Arnold, pp. 101-146.
- Hirschman, Charles et al., 1994. “The Path to Below Replacement Fertility in Thailand,” *International Family Planning Perspectives*, 20-3, pp. 82-87.
- Jiang, Zhenghne et al., 2000. “Fertility Decline and Population Policy in China”, in KIHASA and UNFPA (eds.) *Low Fertility and Policy Responses to Issues of Aging and Welfare*, Seoul, KIHASA, pp. 195-225.
- Kaneko, Ryuichi, 1993. “Wife’s Attitudes toward Marriage and Fertility”, IPP, *The First Report of the Tenth National Fertility Survey*, pp. 28-38.(Japanese)
- Knodel, John et al., 1989. “Has Thailand’s Fertility Decline Stalled?”, *Asian-Pacific Population Journal*, 3-3, pp. 3-20.
- Knodel, John et al., 1996. “Reproductive Preferences and Fertility Trends in Post-transition Thailand,” *Studies in Family Planning*, 27-6, pp. 307-317.
- Kubo Hideji, 1997. History of Family Planning-Meiji, Taisho and Showa Era, Japan Family Planning Association. (Japanese)
- Leibenstein, Harvey, 1957. *Economic Backwardness and Economic Growth: Studies in the Theory of Economic Development*. John Wiley& Sons. New York.
- Lesthaeghe, Ron et al., 1988. “Cultural Dynamics and Economic Theories of fertility Change”, *Population and Development Review*, 14-1, pp.-47.
- Lesthaeghe, Ron et al, 1999. “Is Low Fertility a Temporary Phenomenon in the European Union”, *Population and Development Review*, 25-2, pp. 211-228.
- Lesthaeghe, Ron et al., 2000. “Recent Trends in Fertility and Household Formation in the Industrialized World”, *Jinko Mondai Kenkyu (Journal of Population Problems)*. 56-3, pp. 1-23.

- Lutz, Wolfgang (ed.), 1996. *The Future Population of the World* (rev. ed.), IIASA.
- Muramatsu, Minoru, 1971. "The Analysis of Birth Control in Recent Years in Japan", *Kosei no Sihyo (Welfare Indicators)*, 18-3, pp. 13-20.(Japanese)
- National Institute of Population and Social Security Research (NIPSSR), 1998a. *The First Report on the Eleventh National Fertility Survey*, NIPSSR. (Japanese)
- National Institute of Population and Social Security Research (NIPSSR), 1998b. *The Second Report on the Eleventh National Fertility Survey*, NIPSSR. (Japanese)
- Notestein, Frank W., 1945. "Population: The Long View", T.W. Schultz (ed.) *Food for the World*, University of Chicago Press.
- Pak, Po-Hi, 1998. *Women in the Republic of Korea, A Country Profile*, United Nations ESCAP, Statistical Profiles No.16 Bangkok.
- Palen, J. John, 1986. "Fertility and Eugenics: Singapore's Population Policies", *Population Research and Policy Review*, 5-1, pp. 3-14.
- Park, Chai Bin and N-H. Cho, 1995. "Consequences of Son Reference in a Low Fertility Society: Imbalance of the Sex Ratio at Birth in Korea", *Population and Development Review*, 21-1, pp. 59-84.
- Population Problems Research Council (PPRC), 2000. *The Population of Japan: An Overview of the 50 Postwar Years*, PPRC-The Mainichi Shimbun, Tokyo.
- Ruffolo, Vipin Prachuabmoh et al., 2000. "Consequences of Low Fertility and Policy Responses in Thailand", in KIHASA and UNFPA(eds.), *Low Fertility and Policy Responses to Issues of Ageing and Welfare*, Seoul, KIHASA, pp. 226-254.
- Saw, Swee-Hock, 1986. "A Decade of Fertility Below Replacement Level in Singapore", *Journal of Bio-social Science*, 18-4 pp. 395-401.
- Sweet, Alan, 1996. "Projecting Complete Cohort Fertility in Singapore", *Asian Pacific Population Journal*, 11-1, pp. 59-86.
- Tsuya, Noriko, 1991. "Trends and Correlates of Fertility Decline in the NIES", *Jinkogaku-Kenkyu(Demographic Studies)*, 14, pp. 49-66.(Japanese)
- Tsuya, Noriko, 2000. "Gender Differences in Employment and Housework: A Comparative Analysis of Japan, South Korea, and the United States", *Jinkou Mondai Kenkyu*, 56-2, pp. 25-48.(Japanese)
- United Nations, 1965. *Population Bulletin of the United Nations*, No.7-1963, with Special Reference to Conditions and Trends of Fertility in the World, United Nations, New York.
- United Nations, 1999. *Levels and Trends of Contraceptive Use as Assessed in 1998*, (ESA/o/wok155), United Nations, New York.
- Van de Kaa, D.J., 1987. The Europe's Second Demographic Transition, *Population Bulletin* 42-1, Population Reference Bureau.
- Van de Kaa, D.J., 1999. "Europe and its Population: The Long View", European Population Conference, European Populations: Unity in Diversity, Kluwer Academic Publishers, pp. 1-50.
- Wat, Sui-Ying and R. W.Hodge, 1972. "Social and Economic Factors in Hong Kong Fertility Decline", *Population Studies* 26-3, pp. 455-464.
- Westoff, Charles F. et al., 1977. *The Contraceptive Revolution*, Princeton University Press.
- Westoff, Charles F., 1983. "Fertility Decline in the West: Causes and Prospects", *Population and Development Review*, 9-1.
- Wong, Fai-Ming, 1975. "Industrialization and Family Studies", *Journal of Marriage and the Family*, pp. 985-1000.
- Yamada, Masahiro, 1999. *The Era of Parasite Singles*, Chikuma Shobou, Tokyo.(Japanese)
- Yap, Mui-Ten, 2000. "Low Fertility and Policy Responses in Singapore", in KIHASA and UNFPA (eds.), *Low Fertility and Policy Responses to Issues of Aging and Welfares*, Seoul, KIHASA, pp. 121-143.
- Yu, Xuejun, 1999. "The Present Situation and Future Prospects of China's Population", paper presented at the conference on Population Problems: Recent Developments and their Impact, undertaken by Institute for International Policy Studies, in Tokyo between 7-9 December in 1999.
- Zeng, Yi, 1997. "Dilemmas of Family Size Norms in China", *International Population Conference, Beijing 1997, 11-17 October, Volume 3 [The 23rd General Conference of the International Union for the Scientific Study]*, pp. 1405-1418.
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Table 1. Age-specific and Total Fertility Rates before and after Transition

Country	Year	Age-specific Fertility Rates							TFR	Share of PASFR30+ in TFR
		15-19	20-24	25-29	30-34	35-39	40-44	45-49		
Japan	1925	43	228	259	228	174	75	12	5.11	48
	1940	13	146	239	208	146	62	9	4.12	52
	1950	13	162	238	177	105	36	2	3.65	43
	1960	4	107	182	80	24	5	0	2.02	27
	1975	4	107	190	70	15	2	0	1.91	32
	1998	5	39	103	93	29	3	0	1.36	46
Singapore	1967	37	198	251	170	98	43	8	4.02	40
	1975	17	104	157	96	36	10	1	2.11	34
	1998	8	41	110	105	44	7	0	1.57	49
Hong Kong	1969	19	141	231	165	89	35	5	3.43	43
	1980	12	86	159	106	40	8	1	2.06	38
	1998	5	27	57	56	25	4	0	0.87	49
Korea	1960	35	249	323	273	204	96	16	5.98	49
	1983	12	139	183	53	13	3	1	2.02	17
	1995	3	63	186	70	14	2	0	1.69	26
Thailand	1975	81	239	247	182	143	70	18	4.90	42
	1986	68	166	142	86	56	22	6	2.73	31
	1996	54	126	107	68	36	11	3	2.02	29
China	1970	39	278	308	252	179	83	10	5.75	46
	1990	22	199	156	56	20	6	2	2.29	18
	1994	5	161	144	47	10	4	1	1.86	17
Taiwan	1961	45	249	342	245	156	71	10	5.59	43
	1983	26	154	174	62	13	2	0	2.16	18
	1991	17	92	149	68	16	2	0	1.72	25

Source: United Nations Population Division (2000), Database on Fertility Patterns.

Table 2. Singulate Mean Age at Marriage

Period of census	Japan	Singapore	Hong Kong	Korea	Thailand	China	Taiwan
1920	21.2						21.1
1940	23.3						
1958-1962	25.0	20.3	21.9	21.3	22.1		
1963-1967	24.8		22.5	22.8			
1968-1972	24.7	24.2	23.8	23.3	22.0		
1973-1977	24.5		24.5	23.7			23.3
1978-1982	25.1	26.2	25.3	24.1	22.8	22.4	23.8
1983-1987	25.8		26.6	24.7		22.0	24.7
1988-1992	26.9	27.0	27.7	25.4	23.5	22.1	
1993-1997	27.7		28.6	26.1	24.0		

Source: United Nations Population Division (2000), Database on Marriage Patterns. (Tsuya, 1991) for Taiwan.

Table 3. Celibacy Rate (Percent of Women Never Married at Age 45-49)

Period of Census	Japan	Singapore	Hong Kong	Korea	Thailand	China	Taiwan
1920	1.9						
1940	1.6						
1958-1962	1.5	5.7	7.4	0.1	2.6		1.0
1963-1967	2.1		5.9	0.1			
1968-1972	4.0	3.1	3.8	0.1	3.0		
1973-1977	4.9		2.7	0.2			0.8
1978-1982	4.4	4.2	2.3	0.3	4.1	0.2	1.0
1983-1987	4.3		2.4	0.4		0.1	2.6
1988-1992	4.6	7.3	3.7	0.6	5.2	0.2	
1993-1997	5.6		5.9	1.0	7.0		

Source: United Nations Population Division (2000), Database on Marriage Patterns.
(Tsuya, 1991) for Taiwan.

Table 4. Distribution of Female Cohorts by the Number of Children

Country	Cohort	Number of Children					CEB
		None	1	2	3	4 or more	
Japan	1905-09	8.4	8.7	9.0	10.8	62.3	4.5
	1935-39	6.2	14.5	47.8	22.6	7.4	2.1
	1948-52	3.2	12.1	55.5	24.0	3.5	2.1
Singapore	1921-30	3.2	6.5	8.8	11.0	70.0	5.5
	1950-54	6.4	15.4	43.5	26.2	8.4	2.2
Hong Kong	1926-30	6.6	8.4	10.6	12.8	61.7	4.3
	1941-45	9.2	10.1	25.8	24.8	30.0	2.8
Korea	1916-20	2.2	4.3	6.5	8.7	78.2	5.7
	1950-54	2.1	9.3	50.3	26.8	9.0	2.3
Thailand	1920-24	1.8	5.9	6.6	7.3	74.4	6.3
	1940-44	2.8	4.9	8.5	12.1	68.2	4.1
China	1925-29	3.1	3.8	5.1	7.8	80.2	5.5
	1950-54	1.2	18.4	37.5	26.2	16.7	2.5

Source: United Nations Population Division (2000), Demographic Yearbook Database.

Table 5. Decomposition of TFR Change into Change in Marital Fertility and Change in Proportion Currently Married

Country	Transition period				Below Replacement Period			
	Beginning	End	(a) absolute effect (% effect)	(b) absolute effect (% effect)	Beginning	End	(a) absolute effect (% effect)	(b) absolute effect (% effect)
Japan	1925 (5.10)	1940 (4.17)	0.60 (65)	0.33 (35)				
	1950 (3.60)	1960 (1.99)	0.25 (16)	1.36 (84)				
	1925 (5.10)	1960 (1.99)	1.02 (33)	2.09 (67)	1975 (1.93)	1995 (1.42)	0.69 (135)	-0.18 (-35)
Singapore	1957 (6.56)	1975 (2.11)	1.40 (31)	3.05 (69)	1975 (2.11)	1990 (1.87)	0.41 (171)	-0.17 (-71)
Hong Kong	1966 (4.46)	1981 (1.96)	0.59 (24)	1.91 (76)	1981 (1.96)	1996 (1.06)	0.54 (59)	0.37 (41)
Korea	1960 (5.98)	1983 (2.02)	1.04 (26)	2.92 (74)	1983 (2.02)	1995 (1.69)	0.48 (145)	-0.15 (-45)
Thailand	1960 (5.91)	1996 (2.02)	0.01 (0)	3.87 (100)				
China	1981/82 (2.65)	1990 (2.29)	-0.10 (29)	0.45 (129)				
Taiwan	1956 (6.51)	1983 (2.16)	— (36)	— (64)	1983 (2.16)	1991 (1.72)	— (100)	— (0)

Note: (a) effect of change in proportion married and (b) effect of change in marital fertility

Source: United Nations Population Division (2000), Demographic Yearbook Database and Database on Fertility Patterns. (Freedman et al., 1994) for Taiwan.

Table 6. The Proportion of Labor Force in the Primary Industry

Year	Japan	Singapore	Hong Kong	Korea	Thailand	China
1920	53.8					
1940	44.3					
1950	48.5					
1960	32.7					
1970	19.3	3.8		51.6	*77	
1975	13.8	2.5		46.4	55.8	
1980	10.9	1.5	1.5	34.9	70.9	
1985	9.3	0.9	1.7	26	68.6	*61.5
1990	7.1	*0.3	0.9	18.3	64.1	54.9
1995	6	0.3	0.6	12.5	52.2	50
1998	5.4	0.4	0.3	12.5	51.4	48.5

Source: United Nations Population Division (2000), Demographic Yearbook Database

Table 7. Contraceptive Prevalance Rate (CPR) and Percentage Distribution of Contraceptors by Contraceptive Methods

Country	Survey Year	CPR	Contraceptive Methods (%)					Others
			Sterilization	Pill	Injection	IUD	Condom	
Japan	1959	42.5	2.8	–	–	–	25.9	28.7
	2000	55.9	6.4	1.5	–	2.7	75.3	43.8
Singapore	1977	71.3	21.9	17	–	3.1	20.8	8.5
	1982	74.2	22.9	11.6	–	–	24.3	15.4
Hong Kong	1982	72.3	21.1	19.4	2.7	3.5	14.6	11.1
	1992	86.2	19.8	17.1	1.7	5.1	34.5	8.1
Korea	1985	70.4	40.5	4.3	–	7.4	7.2	11
	1991	79.4	47.3	3	–	9	10.2	9.9
Thailand	1987	67.5	27.9	20	9.2	7.2	1.2	2
	1993	73.9	22.6	27.2	14.8	5.7	1.9	1.9
China	1992	83.4	44.6	3.2	0	33.4	1.8	0.4
Taiwan	1985	78	26	5	–	20	14	14

Source: (United Nations, 1999)

Table 8: Gross Enrollment Ratios at the Tertiary Level of Education

Country		Tertiary Gross Enrollment Ratios				
		1970	1980	1985	1990	1996
China	Male	...	2.5	3.9	3.9	7.3
	Female	...	0.8	1.7	2.0	3.9
China, Hong Kong SAR	Male	...	13.8	16.9	22.5	...
	Female	...	6.6	9.4	16.2	...
Japan	Male	29.3	41.3	40.6	35.1	44.2
	Female	17.7	33.3	34.5	37.4	47.5
Republic of Korea	Male	...	21.3	45.8	51.3	65.5
	Female	...	7.5	21.2	25.1	37.6
Singapore	Male	...	9.1	16.6	22.1	36.7
	Female	...	6.3	10.4	15.2	30.7

Source: UNESCO Yearbook 1999

Table 9. Proportion of Women Who are Single by Age and Education : Japan in 1980 and 1990

Level of Educational Attainment	Age Group							
	25-29		30-34		35-39		40-44	
	1980	1990	1980	1990	1980	1990	1980	1990
Total	23.9	40.2	9.1	13.9	5.5	7.5	4.5	5.8
Compulsory	17.0	30.6	7.7	15.0	4.5	7.9	3.8	5.5
High School	20.5	33.2	8.2	11.4	5.2	6.1	4.3	4.9
Junior College	32.5	46.0	12.6	15.2	8.3	8.6	7.1	7.3
University	40.5	56.2	15.2	18.7	10.6	11.2	10.0	9.7

Source: Bureau of Statistics, MCA, Population Census of Japan for 1980 and 1990.

Table 10. Proportion Single among Male and Female Citizens by Age Group and Highest Qualification Attained: Singapore in 1990 and 2000

Highest Qualification Attained	30-34		35-39		40-44	
	1990	2000	1990	2000	1990	2000
Males						
Below Secondary	37.2	41	21	29.2	12.3	21.1
Secondary	31.4	30.4	15.2	18.3	7.9	13.8
Post Secondary	29.2	29.5	13.2	16	7.9	9.8
University	31.2	33.1	12.4	17.4	6.1	8.6
Females						
Below Secondary	14.9	15.6	10.4	11.1	8	9.1
Secondary	23.6	18.4	19	14.5	17.6	14.8
Post Secondary	30.6	24.4	24.7	21.4	20.9	20.4
University	33.3	32.8	27.3	29.1	24	26.7

Source: SINGAPORE CENSUS OF POPULATION, 2000 ADVANCE DATA RELEASE NO. 8, Table 3, p.3

Figure 1. Total Fertility Rate, 1960–1998

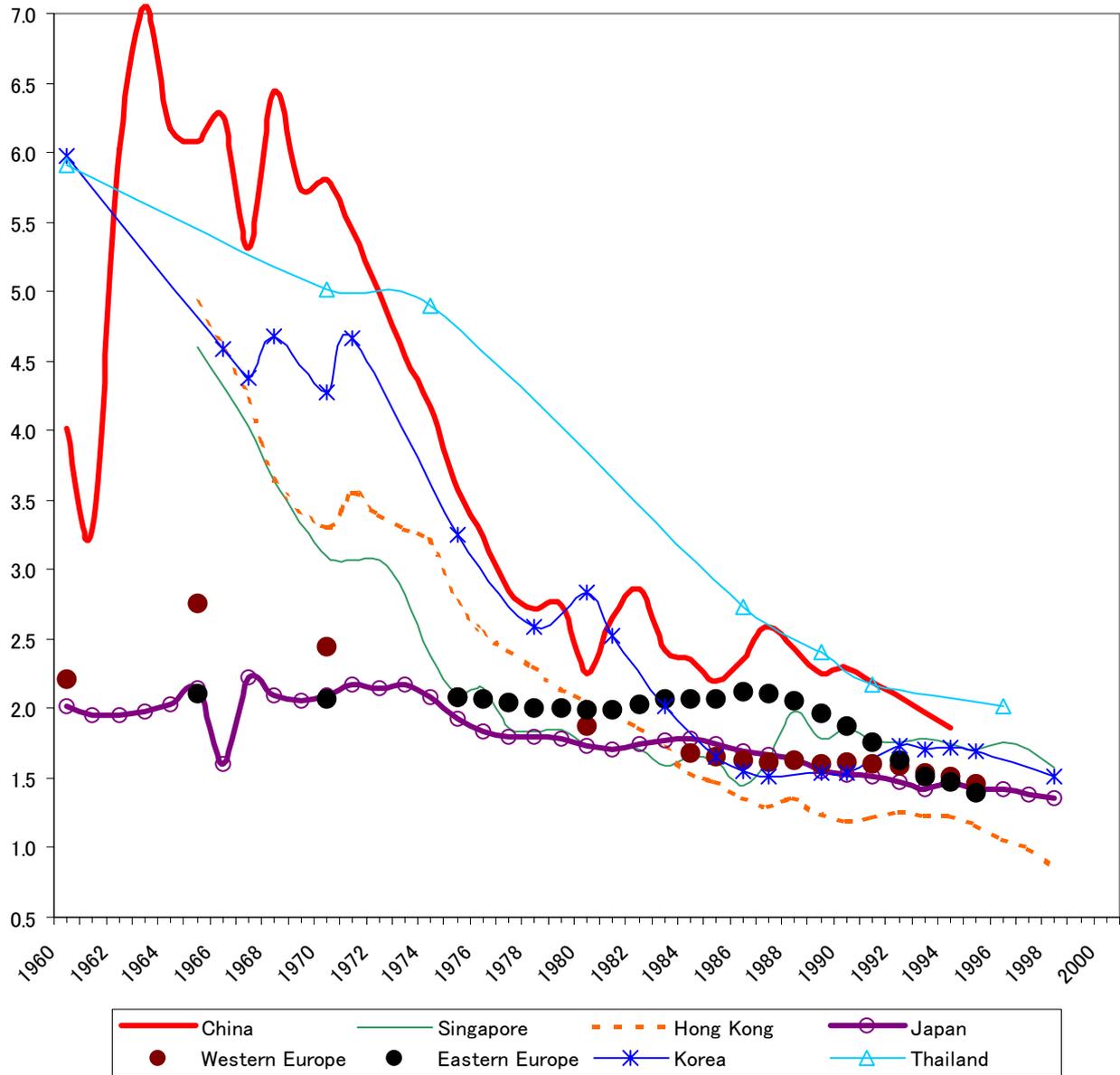


Figure 2. Age at First Birth, 1955-1999

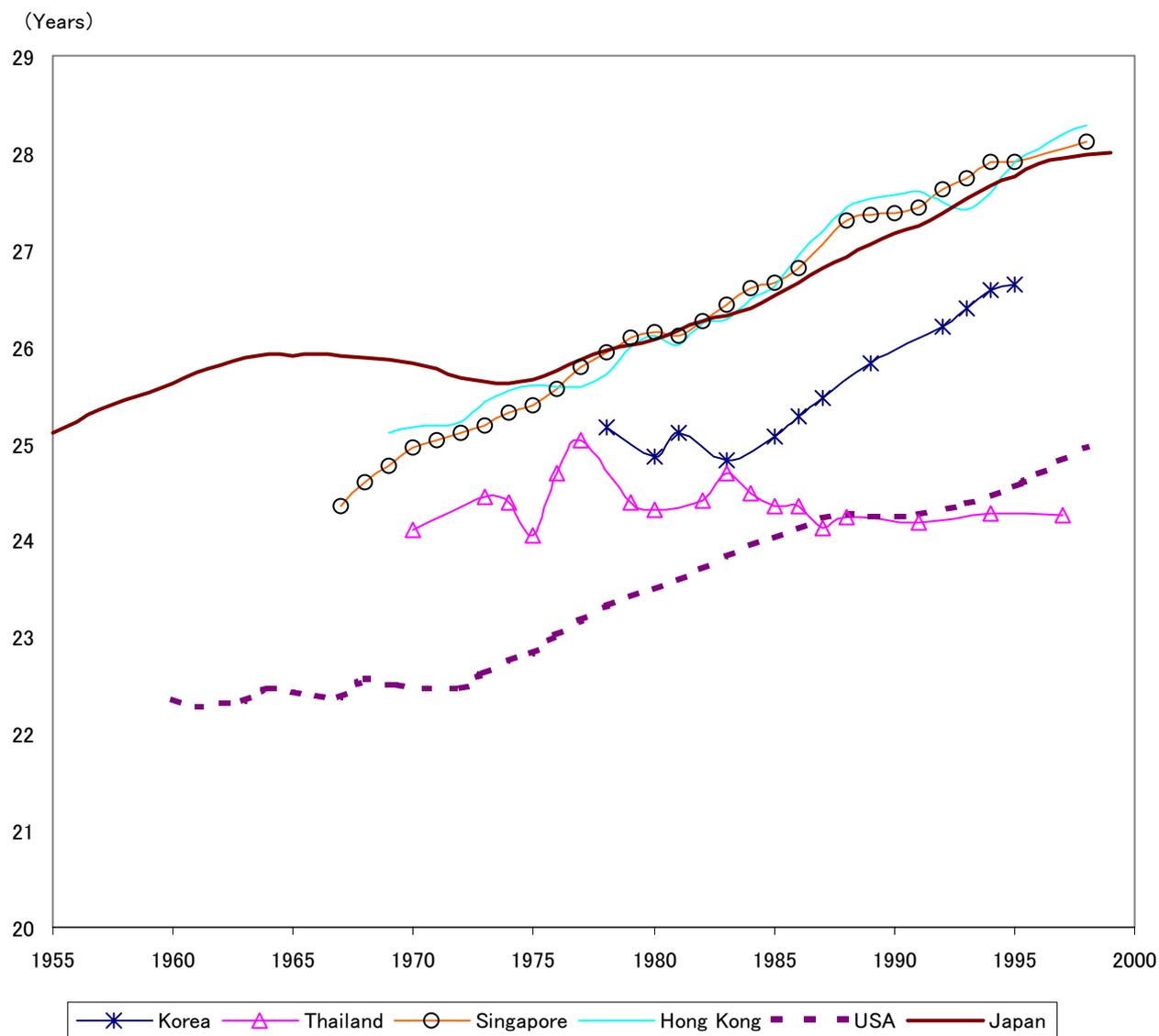


Figure 3. Difference between Total Fertility Rate and Average Birth Order, 1955-1998 (Moving Average)

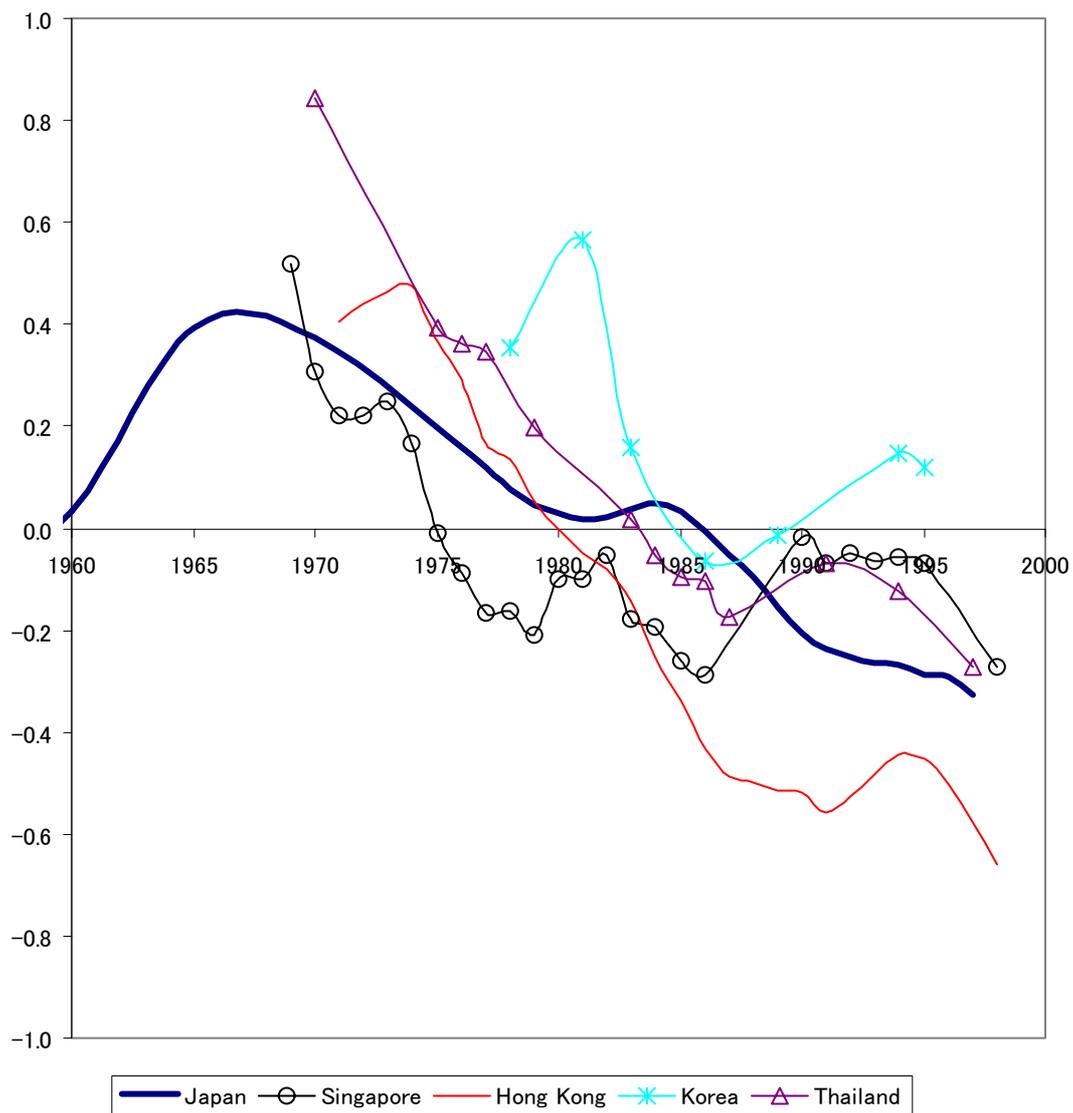


Figure 4. Sum of ASFR of Women Older than 29 as Per Cent of TFR, 1994-1999

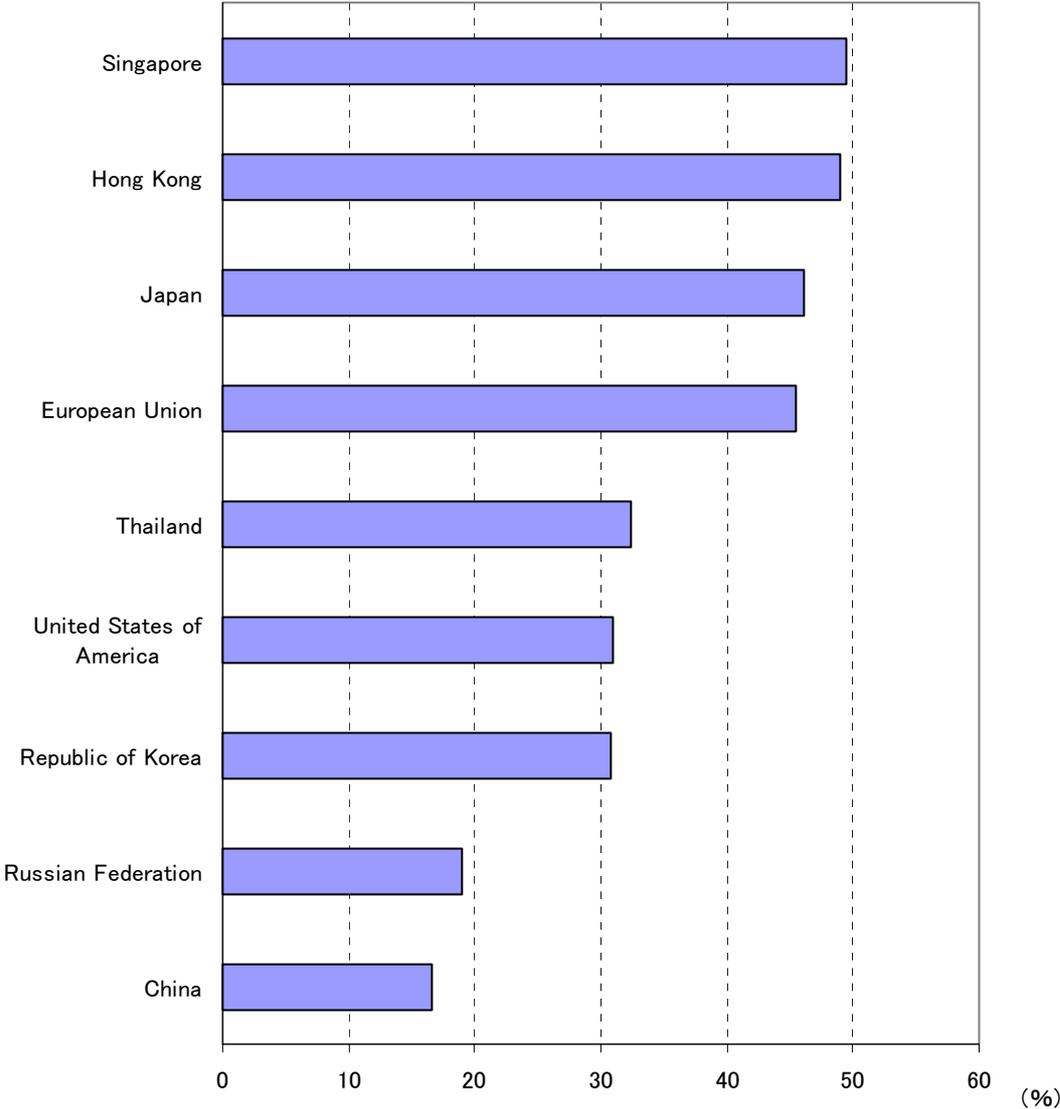


Figure 5. Average Number of Children Ever Born. Cohorts 1897-1952

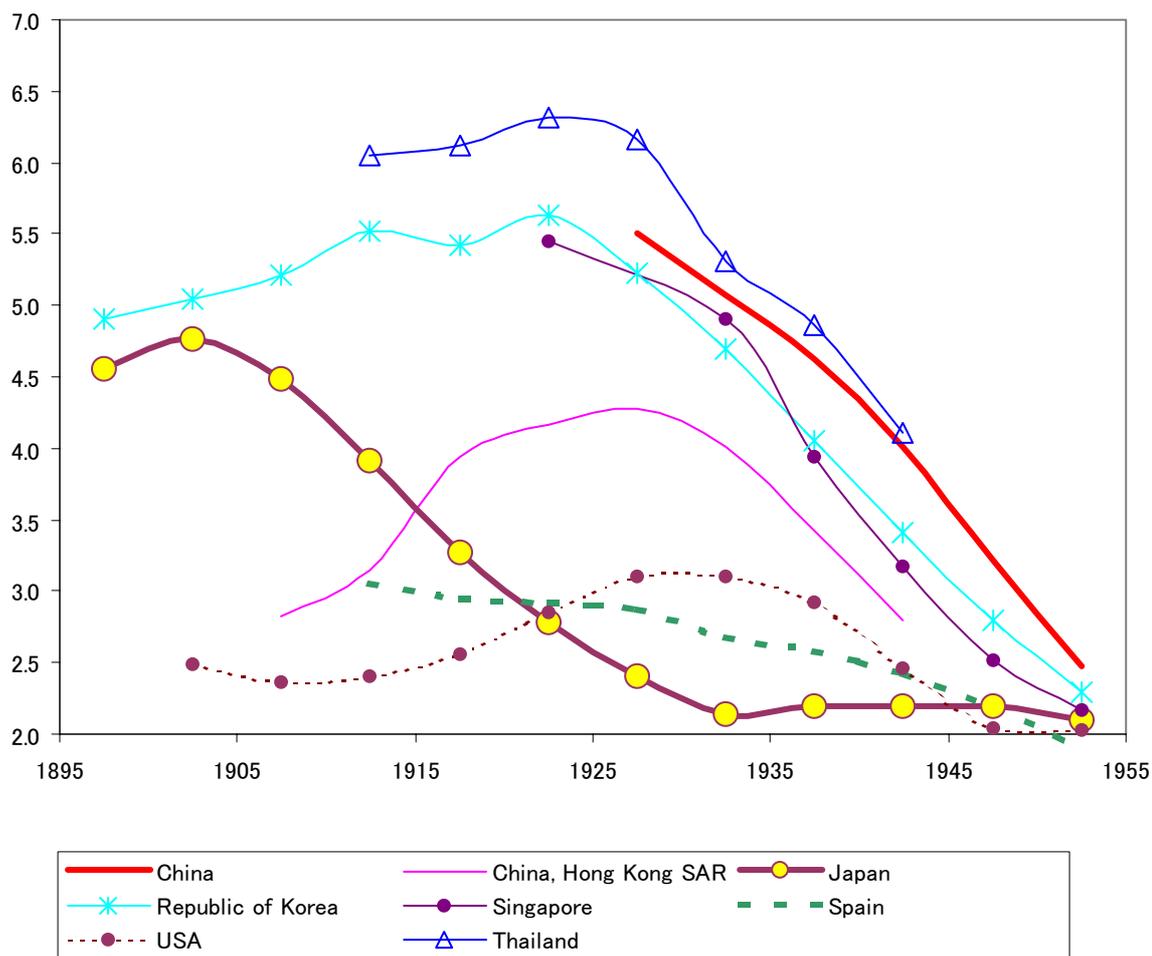


Figure 6. Percentage of Women with 4 or More Children. Cohorts Born in 1897–1952

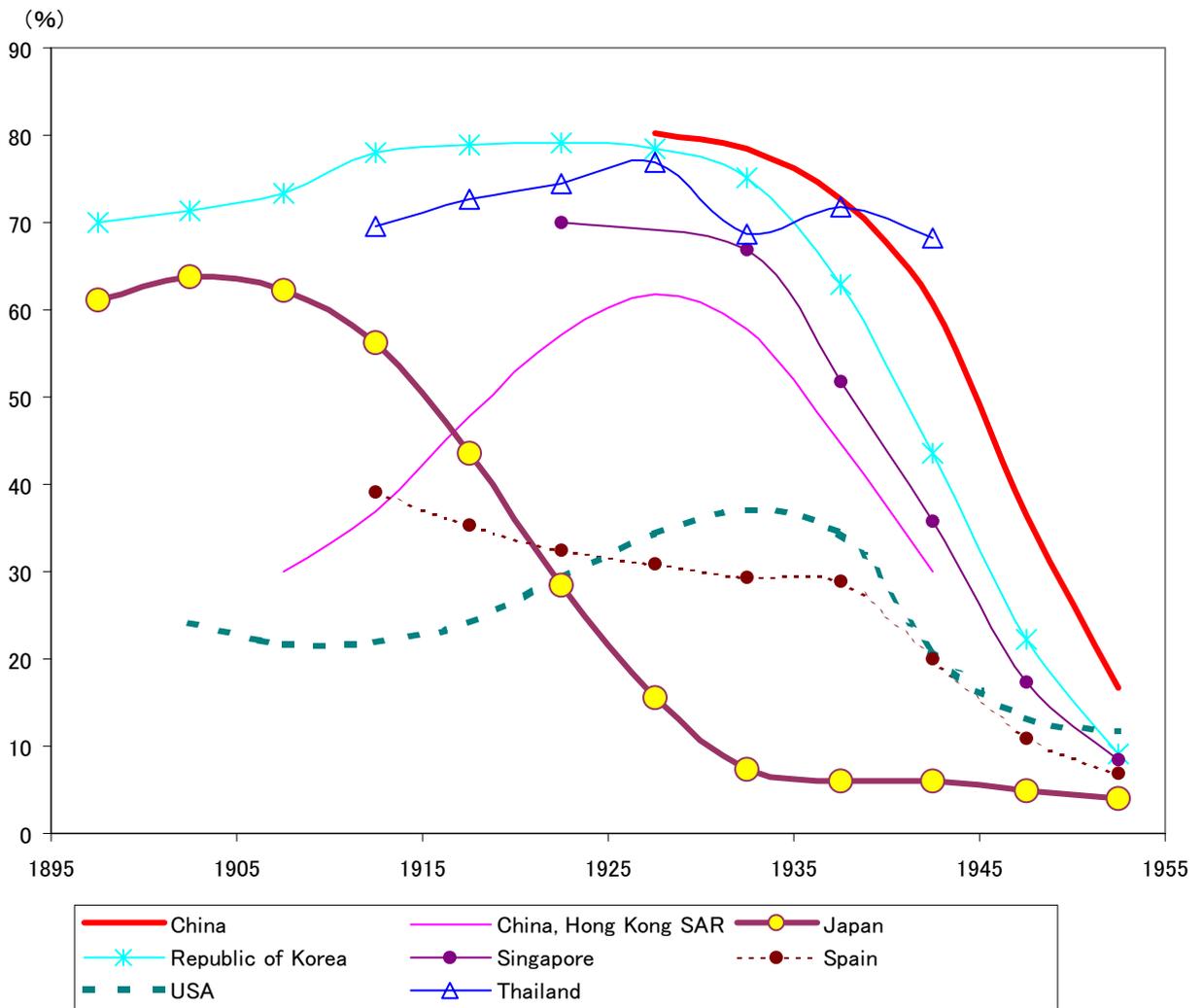


Figure 7. Period Fertility Rates for Birth Orders 4 and Higher, 1960-1998

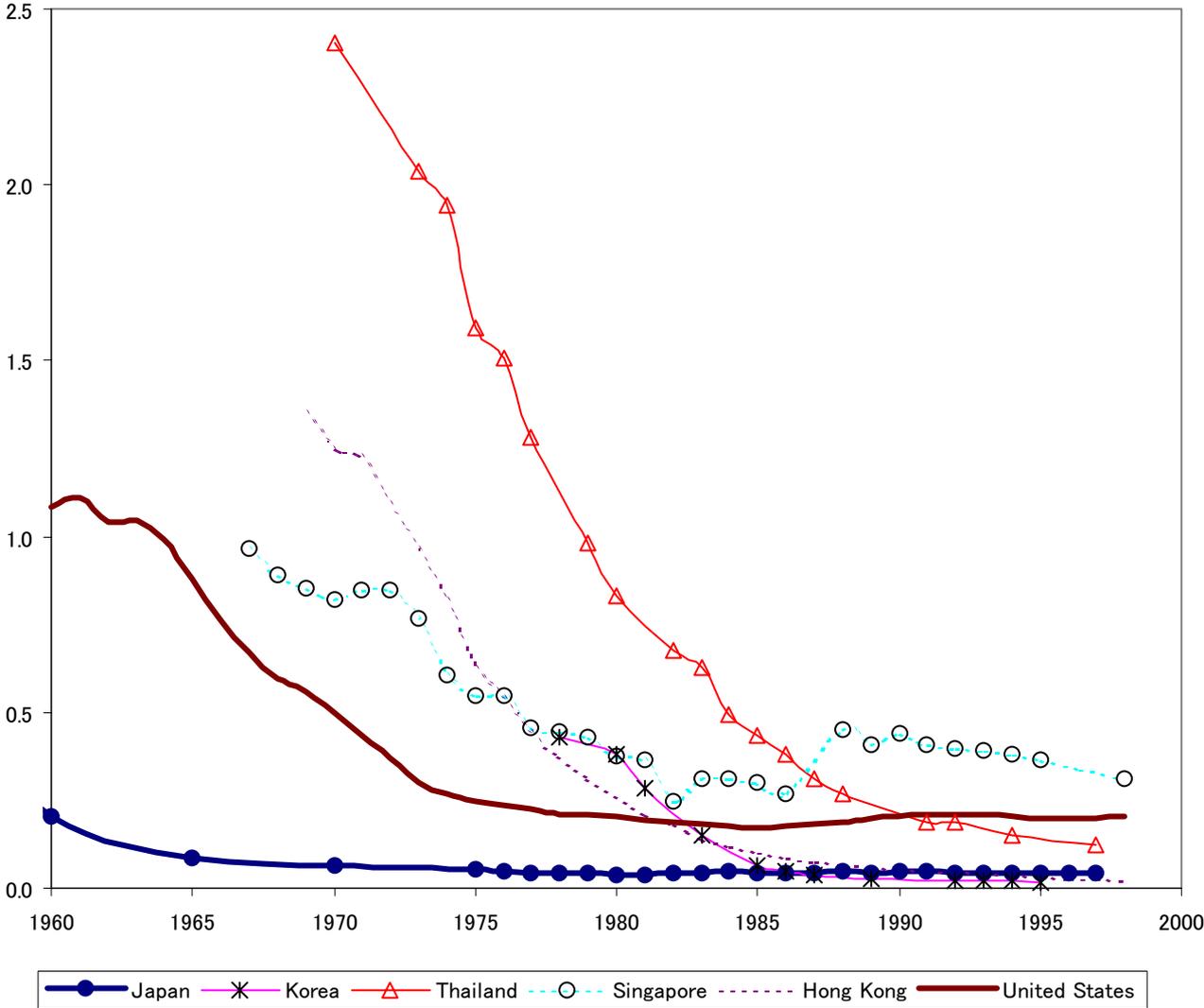


Figure 8. Percentage of Childless Women. Cohorts Born in 1900–1955

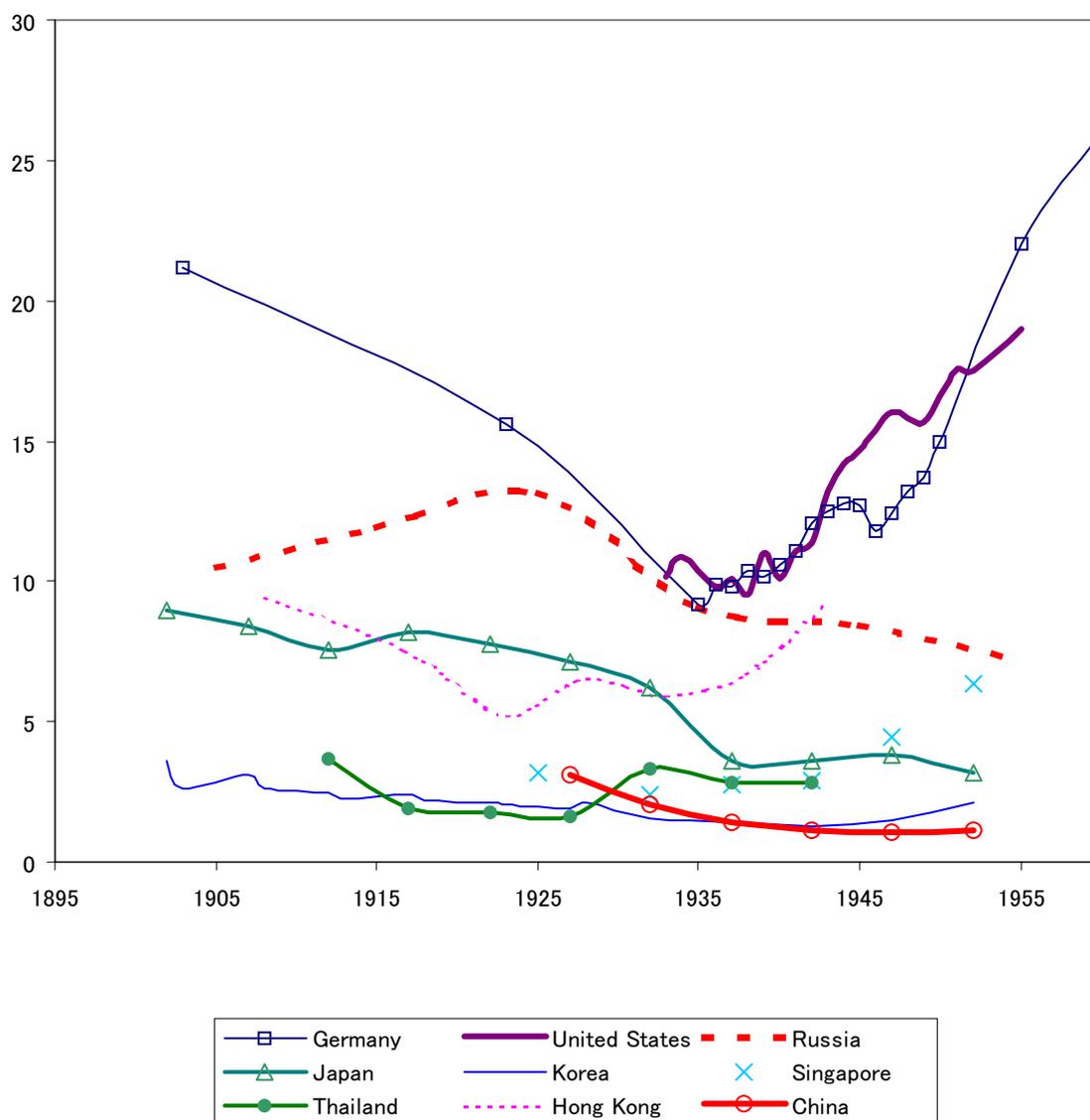


Figure 9. Real GDP per Capita

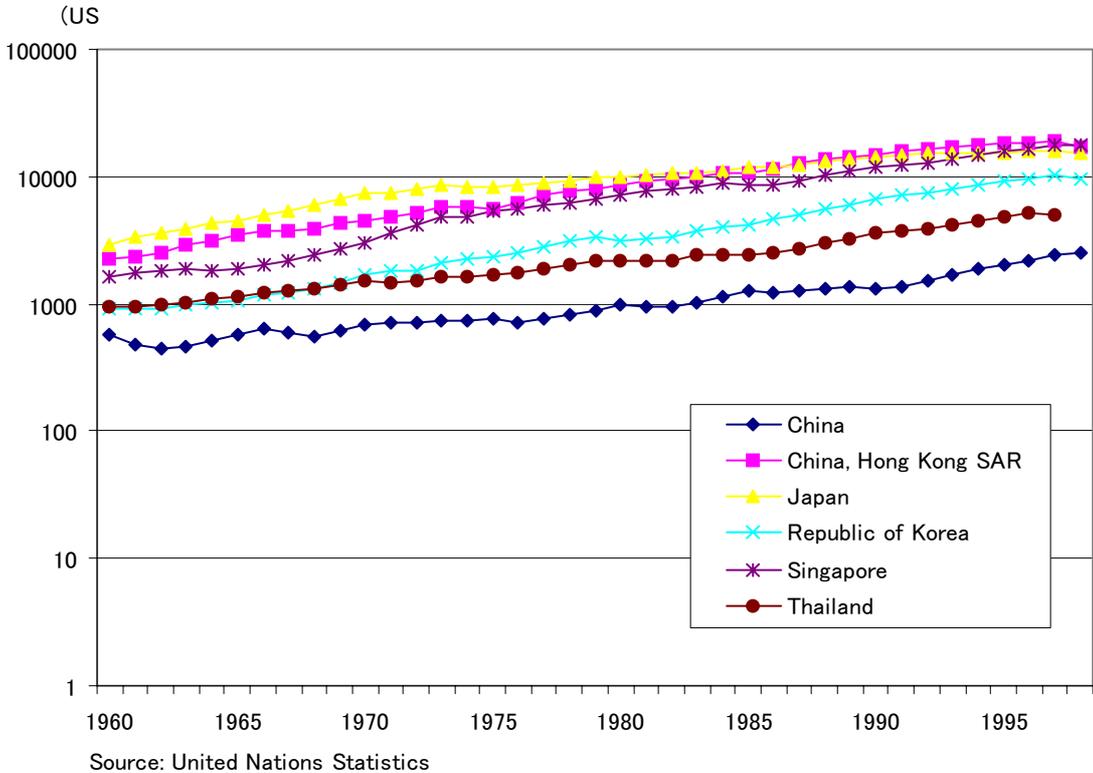


Figure 10. Trends in Labor Force Participation Rates by Age and Sex for Japan: 1975-1995

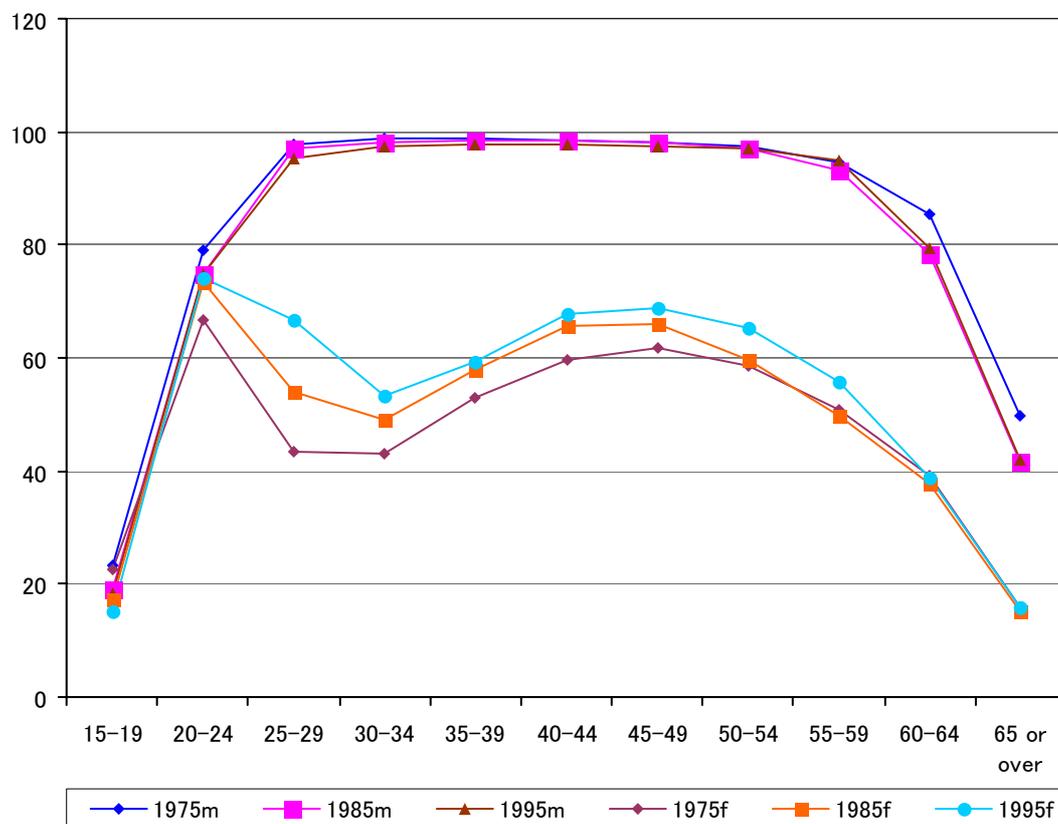
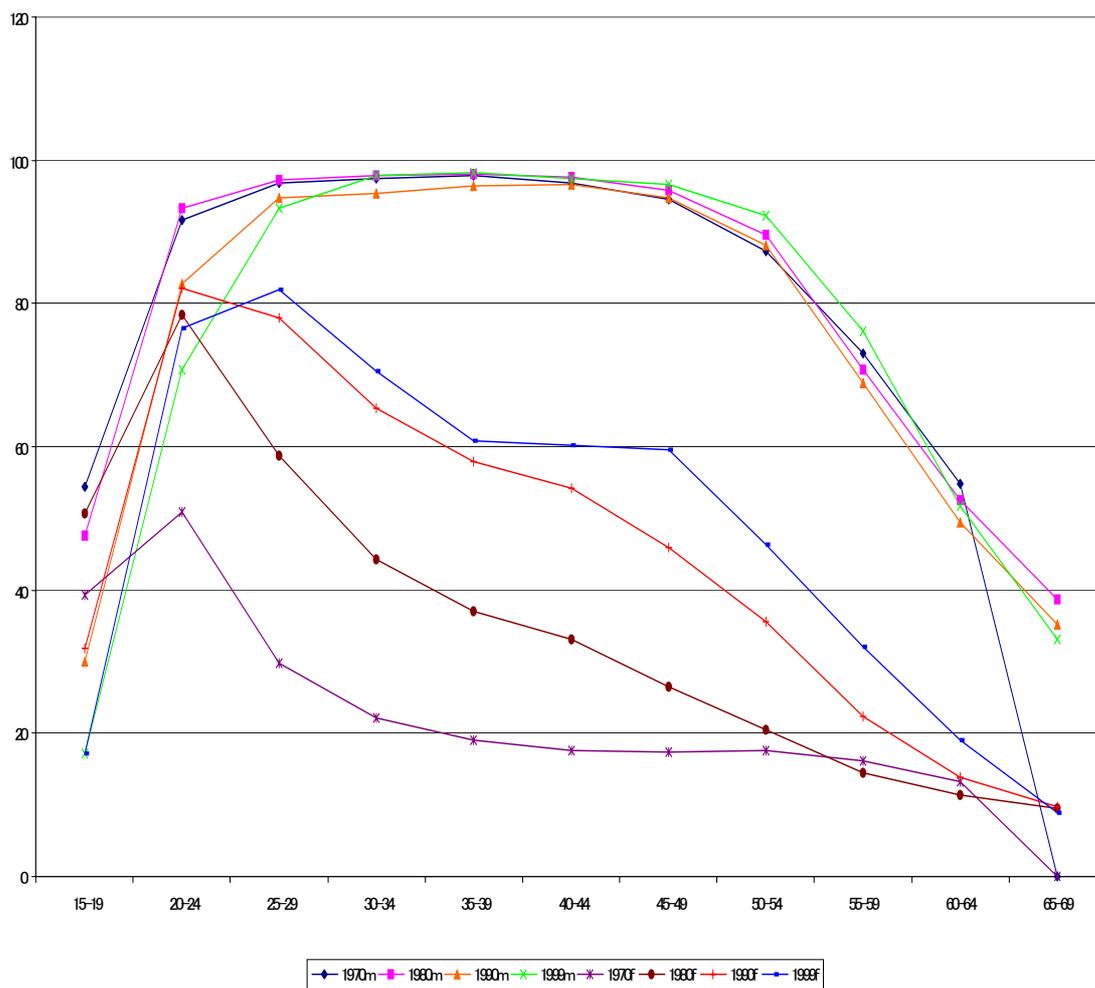
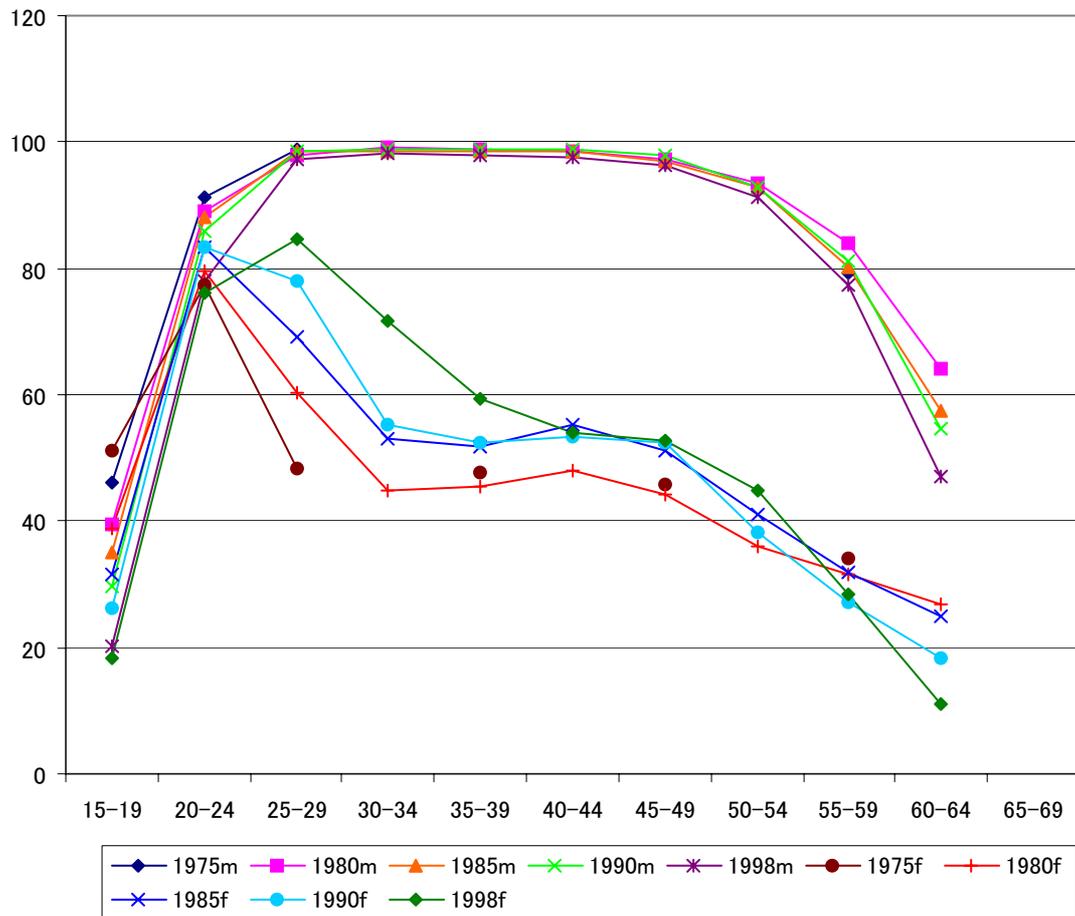


Figure11. Labor Force Participation Rates by sex, Singapore



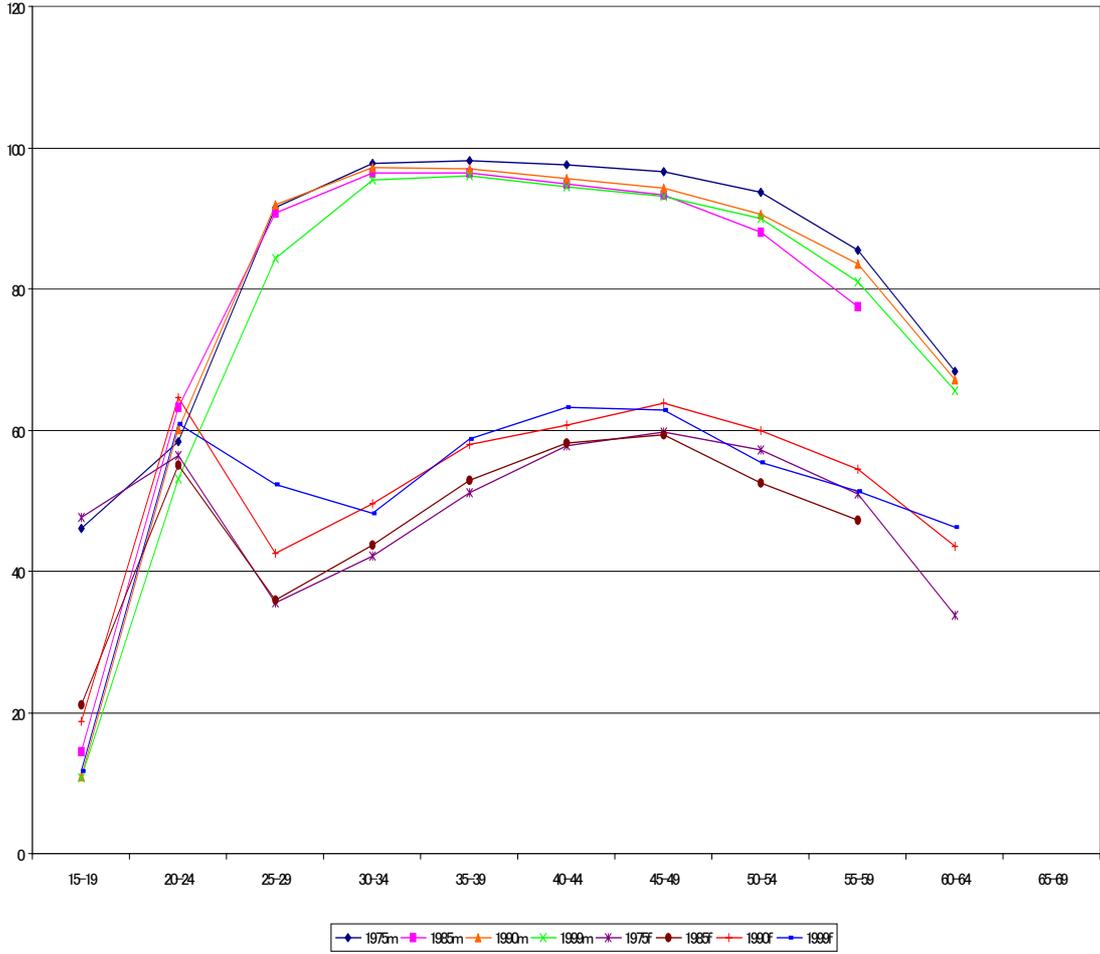
Source: United Nations Population Division (2000), Demographic Yearbook Database.

Figure12. Labor Force Participation Rates by Sex, Hong Kong



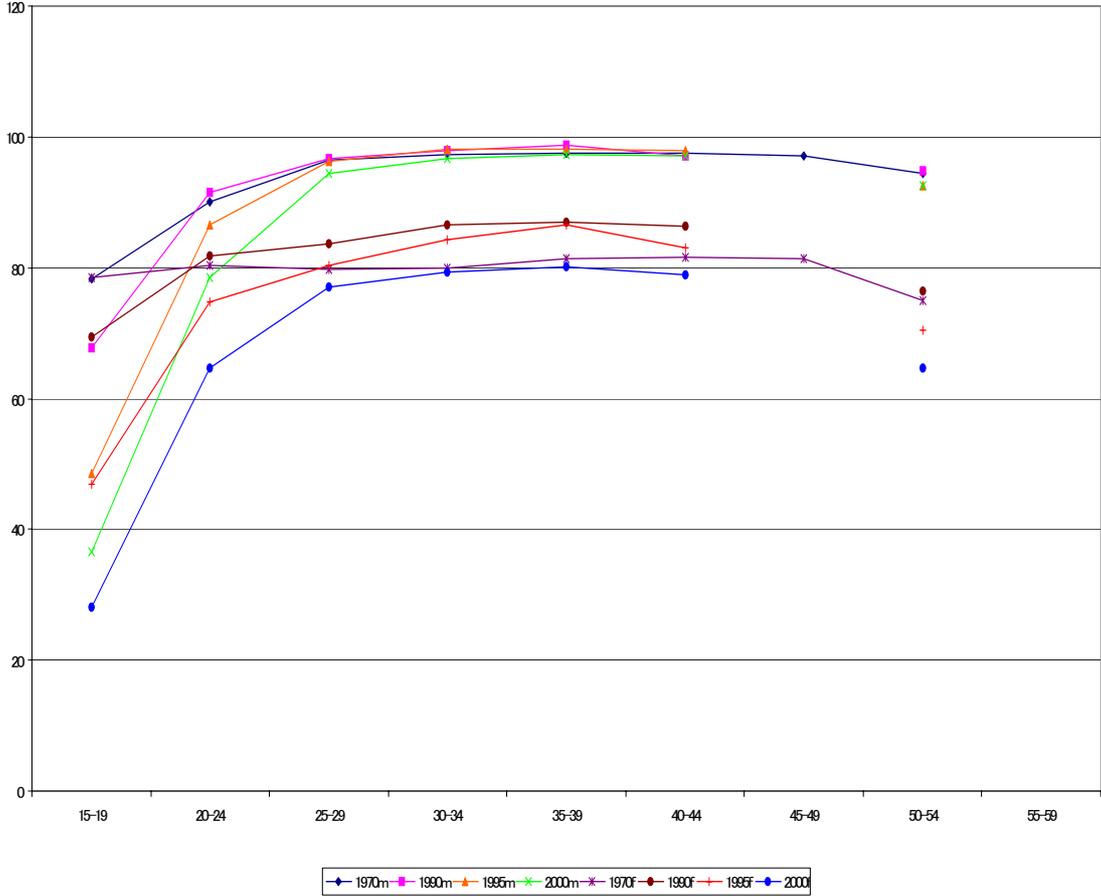
Source: United Nations Population Division (2000), Demographic Yearbook Database.

Figure13 Labor Force Participation Rates by Sex, Rep of Korea



Source: United Nations Population Division (2000), Demographic Yearbook Database.

Figure14. Labor Force Participation Rates by Sex - Thailand



Source: United Nations Population Division (2000), Demographic Yearbook Database.