An Analysis on the Recent Fertility Drop in Korea

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1. Introduction

Fertility is one of the major determinants of a nation's population, together with mortality and migration. Traditionally and until now in developing countries, concerns about fertility have focused on 'excess' fertility, and on its implication for natural and environmental resources. However, the problem faced by most advanced countries today is that their fertility rates have dropped to the levels below those needed to secure generation replacement and maintain stable population structure.

In Korea, the fertility rate drop is a relatively recent phenomenon compared with those in developed countries. In Europe, the 'demographic transition' was around the late 18th to the early 19th century: Infant mortality rate decline in industrial societies enabled families to achieve a given number of children surviving to maturity with lower fertility levels, and availability of birth control and transition from rural to urban society contributed to the long-term decline of fertility rate. With the end of the Second World War, the fertility rate increased significantly but the "baby boom" ended in the 1950s and by the end of the 1950s the fertility rates resumed their downward trend. By the early 1990s, fertility rates in most advanced countries have dropped well below the replacement level and remained stable around the level.[1] However, in Korea, the fertility rate started to decline as late as the 1960s, but the decline has been accelerated during the 1970s. By the mid 1980s, the fertility rate in Korea has reached a level on a par with those in advanced countries.

Besides the timing and speed of the fertility drop in Korea, another major characteristic of the fertility decline is that recently the rate has reached at a level unprecedented in Korea, as well as in most advanced countries. The total fertility rate in Korea in 2002 is 1.17, and it is 1.13 in 2003. Such a low fertility level has been hardly experienced by countries that are not in drastic transition.

Thus, the trend of fertility drop in Korea poses two questions: One is 'Why is the Korea's fertility drop so late and so fast?' and the other question is 'Why is the recent fertility rate so low?' In this paper, I seek answers for the two questions, though they are not complete.

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[1] The placement rate is around 2.1.

2. Korea's Fertility Trend from a Historical Point of View

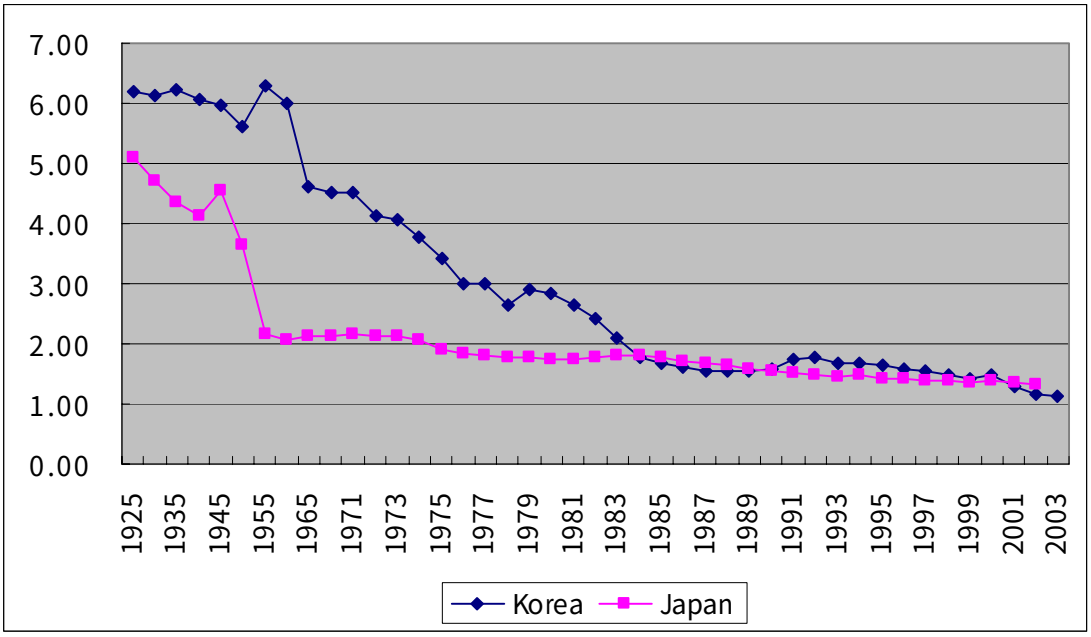
The fertility rate has changed drastically in Korea, as with other social and economic variables. The total fertility rate was roughly over 6 persons per woman before the 1960s, in which Korea's industrialization began. Since a modern population census first conducted in 1925 and repeated with roughly five years' intervals afterwards, fertility rate statistics since 1925 can be found in the literature. Table 1 shows the data along with the Japanese data for comparison. The total fertility rate has been around 6 persons per woman from the 1920s to 1960 without much variation in Korea. In contrast, those in Japan show a slow but steady declining trend since the 1920s. In other words, the 'demographic transition' was a steady process in Japan, but it was much quicker and more abrupt in Korea.

Table 1. Total fertility trend: Korea and Japan, 1925 to 1965

	1925	1930	1935	1940	1945	1950	1955	1960	1965
Korea	6.20	6.13	6.21	6.07	5.96	5.60	6.30	5.99	4.60
Japan	5.11	4.72	4.37	4.12	4.54	3.65	2.16	2.05	2.13

After the 1960, the total fertility trend in Japan shows a very steady downward trend. In contrast, the rate continued to drop fast in Korea during the 1970s and until the mid 1980s. The total fertility rate has been stable during the 1990s, but recently the rate is significantly lower than that in Japan. The 'jump' in fertility rate during 1955 to 1960 in Korea corresponds to her 'baby boom' period. But in Japan the peak was in 1947.

Figure 1. Total fertility rate trend: Korea and Japan, 1925 to 2003



Similar trend can be found in the trend of population growth rates. The population growth rate in Korea until the mid 1950s has been between 1 to 2 per cent per year, despite the high fertility rate. And also the rate is not much different from those in other countries before the industrial revolution. Lucas(2002) estimates that the world population growth rate before the industrial revolution in the 18th century was below 1 percent.

Table 2. Population growth rates of Korea: 1925 to 1955

Year	1925-30	1930-35	1935-40	1940-45	1945-50	1950-55
Population growth rate(%)	1.45	1.67	1.18	1.30	-4.30	1.07

Source: Author's calculation from KNSO, KOSIS.

The population growth rate jumped in Korea during the second half of the 1950s and the 1960s due to birth mortality rate drop and fertility rate rise. But in advanced countries, the population growth rate showed a steady downward trend since the 1950s, and by the end of the 1960s it reached below one percent and remained at the level since then.

Table 3. World population growth rates

Year	1950~55	1955~60	1960~65	1965~70	1970~75	1975~80	1980~85	1985~90	1990~95
Korea	1.02	3.09	2.64	2.25	2.00	1.55	1.36	0.99	0.95
World	1.77	1.85	1.98	2.04	1.95	1.72	1.71	1.70	1.46
Developed countries	1.21	1.18	1.10	0.81	0.79	0.65	0.57	0.60	0.41
Developing countries	2.04	2.15	2.36	2.53	2.37	2.08	2.07	2.02	1.75
Japan	1.43	0.93	0.99	1.07	1.33	0.93	0.68	0.44	0.31
US	1.61	1.69	1.41	1.01	0.94	0.91	0.97	0.99	0.99
France	0.75	1.01	1.30	0.81	0.75	0.44	0.47	0.55	0.45
Germany	0.56	0.66	0.9	0.44	0.25	-0.1	-0.16	0.43	0.57
Sweden	0.7	0.59	0.67	0.78	0.37	0.29	0.10	0.49	0.56

Note: Developed countries are North America, Europe, Japan, Australia and New Zealand.
Source: U.N.(1999)

Such trend suggests that Korea's late rise in population growth rate and rapid fertility rate drop, and the consequent rapid population aging, may be the result of a belated but quick 'demographic transition.' Since modern industrialization began as late as in the 1960s in Korea, population growth rate did not rise until the 1950s. However, as the economic growth since the 1960s was faster than any other country, the 'demographic transition' has progressed quicker than other countries. Figure 2 shows that such a presumption is not groundless. (The population growth rate figures are shown in Table 4.) When population growth rates are plotted against per capita income (in 1985 constant dollars), the pattern of population growth rate change is similar in all regions. Population growth rate rises when per capita income is around 1,000 to 2,000 constant (1985) dollars, and steadily declines in all regions.(Lucas, 2002) Korea's population growth rate change shows a similar pattern with other countries with two distinct characteristics—the population growth rate reached its peak much later but it shows a sharper change. From the pattern, one might conclude that Korea's rapid fertility rate drop—and the consequent rapid aging—is a result of her belated industrialization and rapid economic growth since then.

Figure 2. Trend of Population and Income Growth Rates: 1800~1990

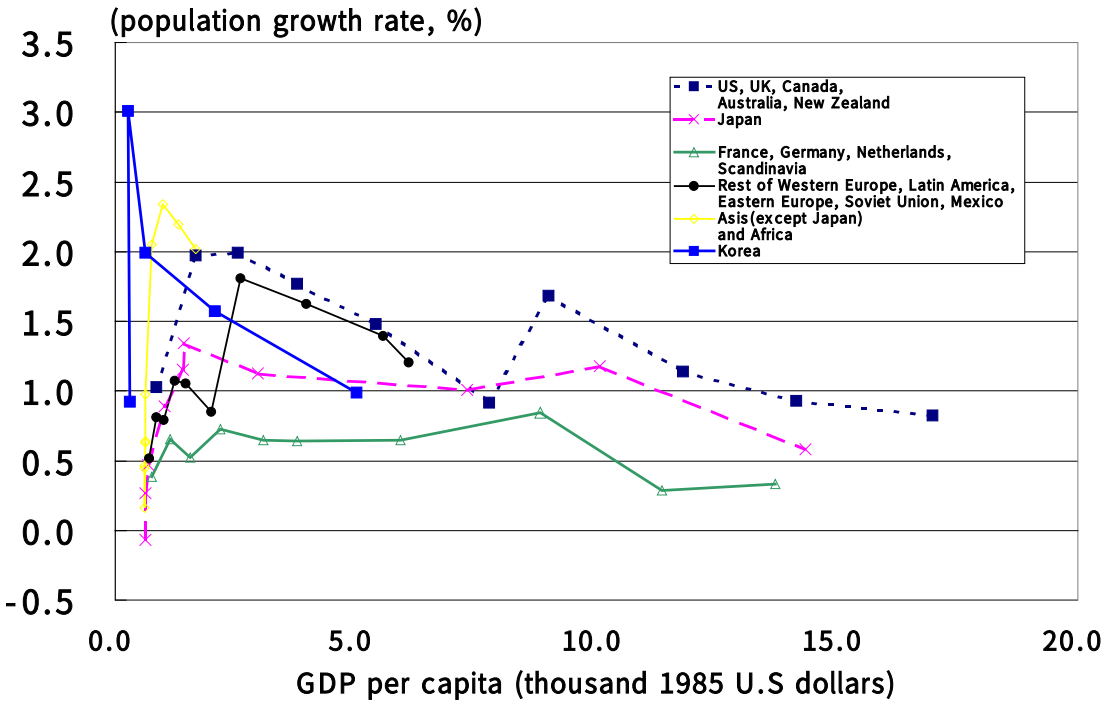


Table 4. Trend of population growth rates: 1800~1990

	Korea	Anglo-Saxon	Japan	Western and North Europe	Other Europe and Latin America	Asia, Africa (except Japan)
1800		1.0	-0.1	0.4	0.5	0.4
1850		2.0	0.3	0.7	0.8	0.5
1875		2.0	0.5	0.5	0.8	0.2
1900		1.8	0.9	0.7	1.1	0.6
1925		1.5	1.2	0.6	1.1	0.6
1950	0.92	0.9	1.3	0.6	0.8	1.0
1960	3.01	1.7	1.1	0.6	1.8	2.1
1970	1.99	1.1	1.0	0.8	1.6	2.3
1980	1.57	0.9	1.2	0.3	1.4	2.2
1990	0.99	0.8	0.6	0.3	1.2	2.0

Source: Lucas(2002) and KNSO.

3. The Characteristics of Fertility Drop

In Korea, the fertility rate continued to drop in the 1970s up to the mid 1980s, and remained relatively stable in the 1990s. The fertility rate rose in the early 1990s, but returned to its previous level in the second half of the 1990s. But it began to fall again since 2000. By comparison, the fertility rates in advanced countries are stable since the 1970s, showing a very mild declining trend. But among them, there are some variations: North and western European countries show relatively high fertility rates, and in some countries they are increasing. Some countries show significant fluctuation of fertility rates. For example, the Swedish fertility rate rose in the late 1980s to the early 1990s, but returned to its mid 1980s level by the late 1990s. Southern European countries, such as Italy and Spain, show rapidly dropping fertility rates, resulting rapid population aging. Central European countries, Germany and the neighboring countries, show intermediate trends.

Figure 3. International Comparison of Total Fertility Rate Trends: 1970~2000

Table 5. Total Fertility Rate Trend of Korea: 1990~2003

1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
1.59	1.74	1.78	1.67	1.67	1.65	1.58	1.54	1.47	1.42	1.47	1.30	1.17	1.13

The general stylized facts of fertility, obtained from international comparison study are as follows: (i) The correlation between women's general education level and fertility is not strong. Within a country, better educated women tend to give fewer births, but in international comparison the country with higher general education does not necessarily have a lower fertility rate. (ii) The correlation between female labor participation and fertility is not strong. For example, the U.S. and Sweden are the countries with the highest level of female labor participation, but the fertility rates are not low. (iii) The methods of birth control and fertility level are also not correlated. The frequency of abortion is correlated with methods of birth control, and not with the fertility rate. (iv) Fertility rates are high in countries with high illegitimacy rate, but the causal relationship is not

clear. High illegitimacy rate is an evidence of changing marriage system without any clear implication on fertility. Variables shown to have positive relationship with fertility are youth labor market conditions and housing: A better youth labor market condition is empirically shown to have a positive effect on fertility, and the youth's independent living also have positive relationship with high fertility rates.

Korea's rapid fertility drop has been accompanied by a rise in marriage and first childbirth age of women, and consequently a rise in average age of women at childbirth. As shown in Figure 4, between 1985 and 2002 during in which total fertility rate dropped from 1.70 to 1.17, average marriage age increased from 24.1 to 27.1 and average first childbirth age increase from 24.9 to 28.3. Consequently, during 1980 to 2000 the number of women at childbirth in their twenties has significantly decreased, while those in their thirties increased.(Figure 5)

Figure 4. Trend of Marriage and The First Birth Age

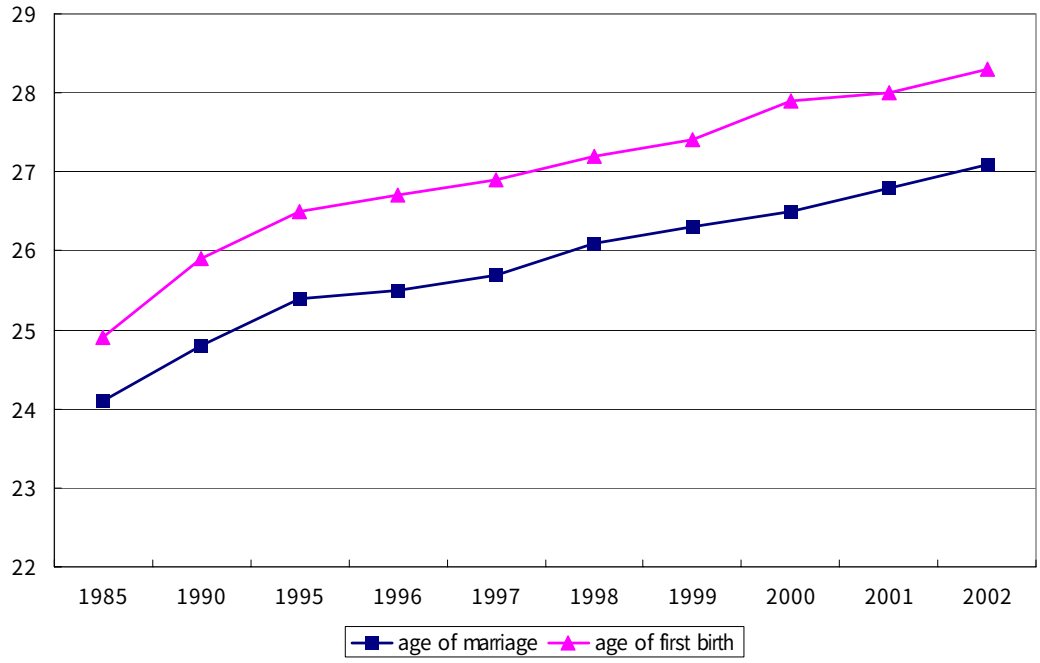
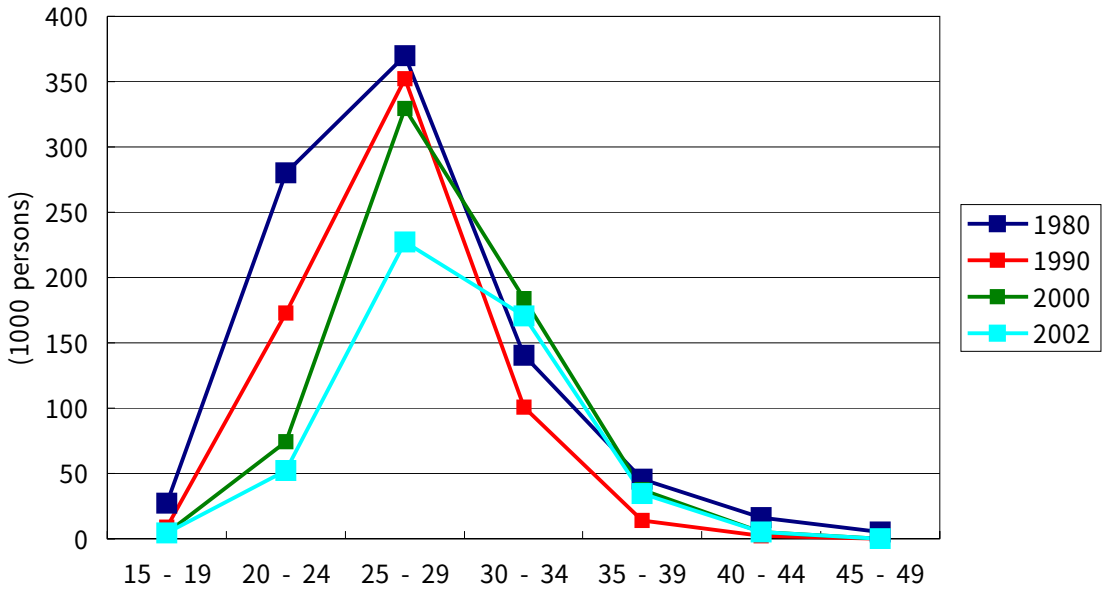


Figure 5. Distribution of Women's Age at Childbirth



Given that the rise in childbirth age is the major cause for fertility rate drop, a candidate for causes of fertility decline is the quick rise in women's educational level. Figure 6 shows the age-fertility pattern by educational level for the cohort of women born in 1965. Middle and high school graduate women tend to begin their childbearing in their early twenties, whereas college graduates begin in their late twenties. Also, the educational composition of Korean women at childbirth is rising very quickly. The share of women with some college education among those who gave childbirth in the year has increase from 6.7% in 1982 to 40.6% in 2001. Hence, educational upgrading of women itself might explain a significant portion of fertility rate drop. Further, the share is expected to increase for a while in the near future. Figure 7 shows the educational composition of women by age obtained from 2000 Census data. As the majority of women at

childbirth are from 25 to 35 years old, and the share of college graduate are highest among those in early 20s in 2000, the share of women in some college education among the childbearing women will continue to rise in the near future. To evaluate the effect of educational upgrading to fertility rate, a simple simulation is conducted and the result is reported in Figure 8.

Figure 6. Age Specific Fertility by Educational Level: 1965 cohort

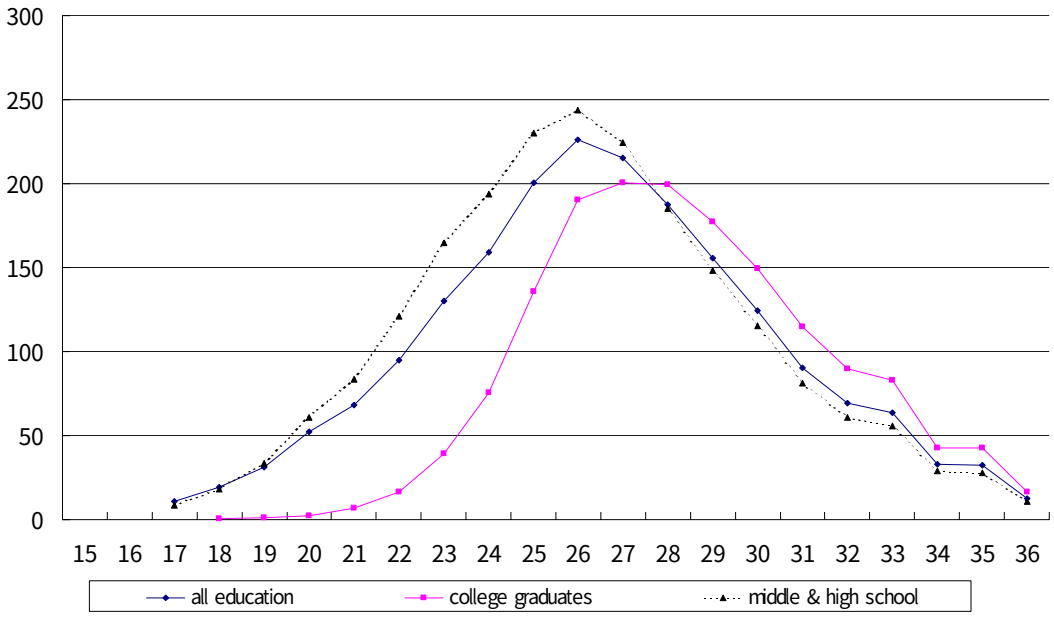


Table 6. Educational composition of Women at Childbirth (%)

	1982	1990	1995	2000	2001
Middle and high school	64.5	76.3	72.3	61.3	58.1
Some college	6.7	19.4	25.7	37.5	40.6

Figure 7. Women's Educational Composition: 2000

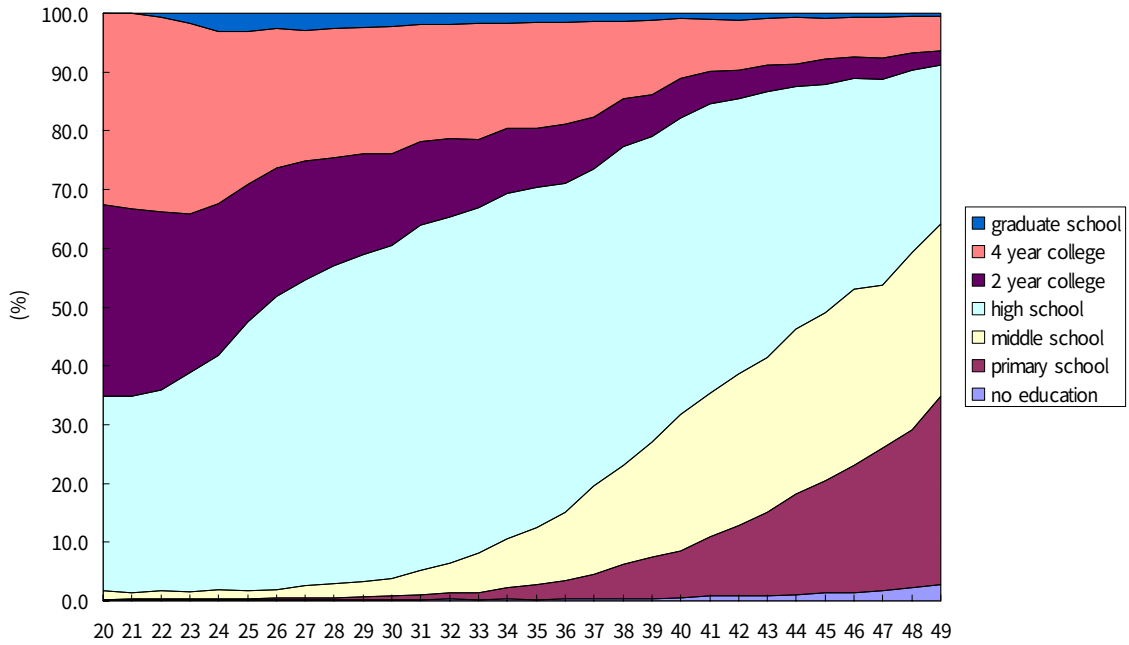
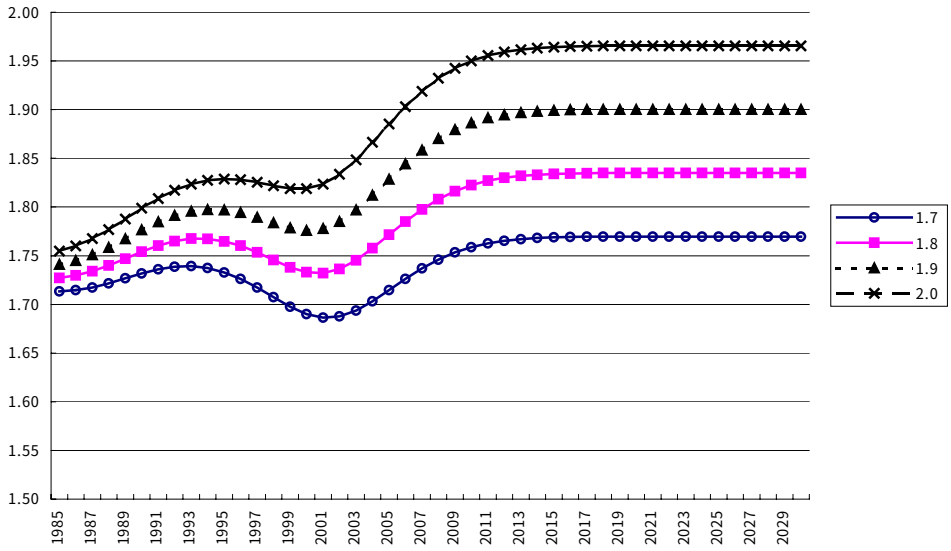


Figure 8. Simulation of Total Fertility Rates



In the simulation, it was assumed that the age specific fertility rates of women in each educational group class are the same of those in 1965 birth cohort with the corresponding education. And future educational composition of women are projected under the assumption that women's educational level does not rise future from those of the 20 years old in 2000. For completed fertility rates, 2.0 and 1.9 are assumed for primary school and middle and high school graduates and 1.7 to 2.0 are assumed for college graduates.

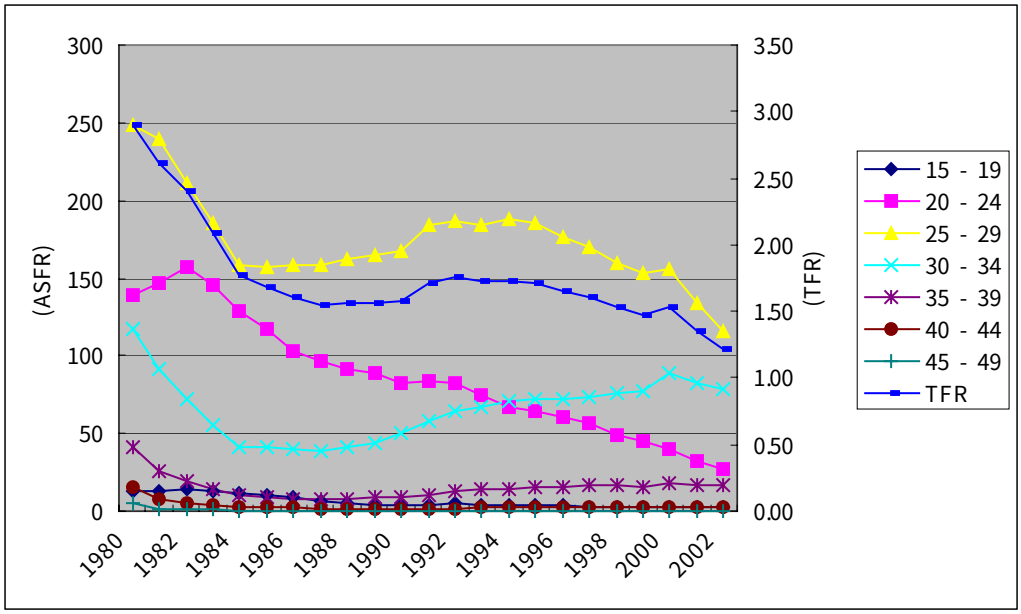
The simulation result shows that the educational upgrading will exert some downward pressure to total fertility rate, but the pressure is highest in the early 2000s, and will disappear since then as the educational upgrading tapers out, which is a result of the assumption that the educational level does not increase further from that of the 20 year old women's in 2000. The simulation also accounted for the rise in fertility rate in the early twenties. As the share of high school graduate women quickly reduced in the late 1980s, the birth timing has been delayed, resulting a fall in the end of 1980s and a rise in the early 1990s. However, the fertility rate change implied by such simulation, which exploits only the change in educational composition without assuming the rise in childbirth ages within the educational groups turned out to be very small compared with the actual drop in fertility rate.

Another candidate explanation for recent fertility drop is the worsened youth labor market condition since the economic crisis that broke out at the end of 1997. However, as the fertility rate

continued to drop even after economic recovery thereafter, the explanation is not so persuasive.

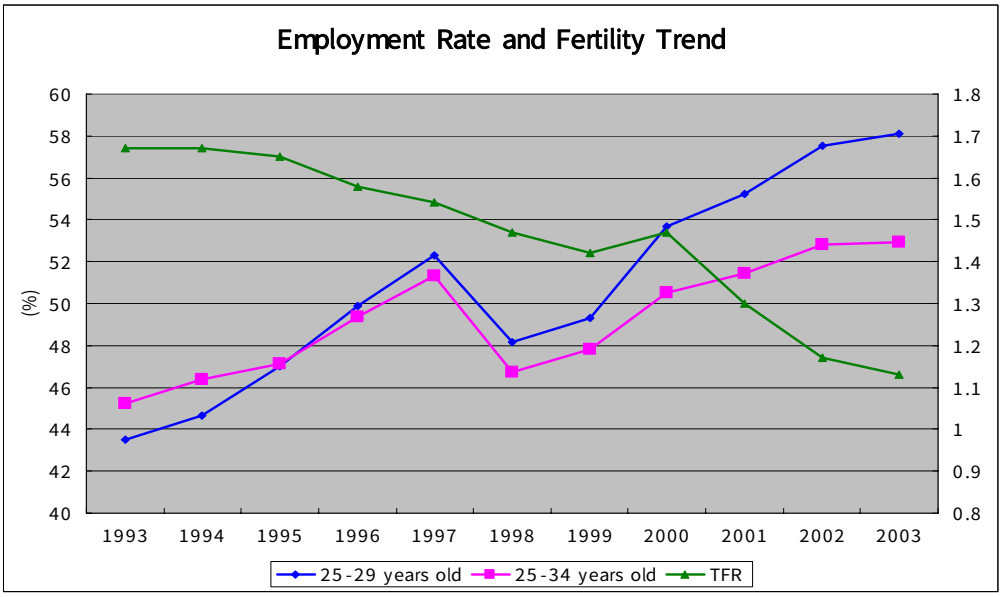
The recent low fertility rate is primarily due to the drop in the fertility rate among the women in their second half of the twenties. Figure 9 shows that in the early 1990s, age specific fertility rate of the second half of the twenties increased while those among the first half of the twenties dropped. However, since the late 1990s and especially in 2002 and 2003, the age specific fertility rate of the second half of the twenties dropped sharply without those of the thirties increasing. This may suggest that women in their second half of twenties are delaying their childbirth, and the age specific fertility rate among the thirties could increase in near future. But if we refer to the trend in foreign countries, the increase may be limited.

Figure 9. Trend of Age Specific Fertility Rates



A plausible explanation for the drop in age specific fertility rate among the women in their second half of twenties is the rise in their labor participation. As shown in Figure 10, the employment rate of women, especially in their second half of twenties has increase remarkably since 1998, especially among those highly educated. Further, the change is in exact opposite direction from that of the fertility trend. Thus, it seems that the rise in women's job opportunity and the rise in shadow cost of childbearing may have contributed significantly to the recent fertility drop, and such effect of labor market condition change is worth further investigation.

Figure 10. Trend of Women's Employment Rate and Fertility



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