Fertility Decline and Policy Development in Japan

TORU SUZUKI
(NATIONAL INSTITUTE OF POPULATION AND SOCIAL SECURITY RESEARCH)

Preface

This paper was prepared for an international conference which was held in Seoul on 15-16 December 2005 on relevant policies to offset low fertility.

We would like to express our gratitude to KIHASA, the organizer of the International Conference on Low Fertility and Effectiveness of Policy Measures in Seoul for making this paper possible.

Table of Contents

List of Tables

List of Figures

Summary

As the result of below replacement fertility since the mid 1970s, Japan's population is about to start declining. Such demographic changes as rapid population aging, decline in working age population, and sharp increase in dependency ratio will cause many serious problems including crisis of public pension system, labor shortage, economic recession, and loss of societal vitality.

Japan's TFR in 2004 was 1.29, which was "lowest-low" fertility defined to have TFR of 1.3 or less. It seems to be impossible for cohorts born after 1960 to achieve the complete fertility of its predecessors. The delay in childbearing was accelerated again after 2000. It was shown that both nuptiality and marital fertility contributed to the recent fertility decline. For marital fertility, it was supposed that coital frequency and infecundity were primary factors, though data were not available. Demands for spouse and children are not declining rapidly and are not at lowest-low level. Thus, recent fertility decline should be explained not from demand itself but from obstacles to fulfill the demand. Firstly, the increase in direct cost of children is attributable to growing human investments on education and health of children. Secondly, the economic recession

hindered young people's economic independence and propensity to marry. Married couples were also psychologically depressed from the bad economy and avoided to have children. Finally, under the low compatibility between wife's work and childrearing in Japan, the growth in female labor force participation had a significant negative impact on fertility.

The Japanese government has been adopting pronatal measures since the early 1990s but has not succeeded in preventing fertility decline Measures applied by the central government include expansion of child allowance, introduction of childcare leave, improvement in childcare services, subsidization of medical treatment for infecundity, etc. The Next Generation Law in 2003 demanded local governments and large companies to submit their own plans on bearing and rearing new generations. Many local governments are offering one time cash benefit, inventing additional child allowance, promoting childcare leave, and improving childcare services. There are some companies that are increasing child allowance or prolonging childcare leave.

However, pronatal measures are not as effective as expected. Quantitative analyses show that it is very difficult to elevate TFR by 0.1 with policy interventions. Although there are considerable evidences on the effectiveness of pronatal policy, there is no reason to expect that policy intervention can induce sustainable recovery of fertility. A

cultural deterministic view on fertility asserts that most of the differences between moderately low and lowest-low (or very low) fertility are attributed to direct effects of cultural features, not to governmental efforts. It should be seen that lowest-low fertility is a natural response to socioeconomic changes in the postmaterial period. In this perspective, Western and Northern Europe and English-speaking countries that have avoided lowest-low fertility should be seen as exceptional and requiring explanation. These countries share such cultural features as weak family ties, traditional high position of women, early independence of children, and high prevalence of cohabitation and extramarital births. While these characteristics successfully prevented fertility from falling to lowest-low level, Southern and Eastern European countries and Eastern Asian countries could not resist the socio-economic changes that lead fertility to lowest-low level.

These cultural differences are beyond the governmental policy. Continuous fertility recovery will be induced not by governmental efforts but by spontaneous change in family pattern. Although there is a sign of assimilation to Western-Northern weak family pattern in Southern European countries, such a change would be more difficult to take place in Eastern Asia. Then, it is thought that lowest-low fertility in Eastern Asia will last longer and fall further than that of European forerunners.

Introduction

Japan is now entering a new demographic phase. After the population growth that tripled Japanese population during the 20th century, the period of population decline is about to start. Although the official population projection (NIPSSR, 2002) foresees that the period between October 2006 and October 2007 will mark the first population decrease, the vital statistics recorded the natural decrease in the first half of 2005. If the annual number of deaths eventually overcomes that of births and is not compensated by the net immigration, Japan will step into the population decline regime in this year.

There is no need to say that the reduction in population growth rate was brought about by the declining fertility. The fertility of Japan has been below replacement level since the second half of the 1970s. Total Fertility Rate (TFR) of Japan was 1.29 in 2004, which was lowest-low level defined as 1.3 or less (Kohler et al., 2002). The momentum of population growth in the past enabled Japanese population to grow for three decades after the fertility fell below replacement level. However, the momentum in Japan is fading away and the population decline

is an unavoidable destiny.

An extremely low fertility results in rapid population aging, decline in working age population, and sharp increase in dependency ratio. Such demographic changes will cause many serious problems including crisis of public pension system, labor shortage, economic recession, and loss of societal vitality. The Japanese government was shocked with the TFR of 1.57 in 1989 and launched a variety of pronatal policy measures. However, these policy interventions have not yet succeeded in preventing fertility decline.

This paper firstly examines the history and destiny of Japanese population. Projections shown in this section are based on the medium variant of NIPSSR (2002). Then, the recent fertility decline and its determinants are analyzed. Thirdly, policy measures taken in Japan are described and their effects are evaluated. The final section will discuss the cultural patterns that differentiate fertility and the future of lowest-low fertility in Eastern Asia.

Chapter 1. Postwar Population Changes in Japan

1-1. Population Dynamics

The postwar period of Japan started with Malthus's nightmare of overpopulation. Millions of soldiers and oversea civilians returned in the second half of the 1940s. The postwar baby boom brought about more than eight million births between 1947 and 1949. As shown in Figure 1, the total population arrived at 80 million in 1948. However, Japan and its followers in Eastern Asia demonstrated that, given the right conditions and right policies, rapid population growth is not impoverishing. Agricultural technology enabled food production to grow faster than population. The pace of industrialization was so fast that it expanded the employment opportunities of young workers (Mason, 2001, p. 4).

In addition to these improvements in capacity and opportunity, population growth rate in Japan rapidly declined in the 1950s thanks to the fertility transition. As Figure 2 demonstrates, the growth rate dropped to be less than 1% in the latter half of the 1950s. The valley in 1966 was caused by the drop of births due to Hinoeuma year. The spike in 1972 was the return of Okinawa prefecture. As presented in Figure 3, the magnitude of international migration has been very

small except for immediately after the war and in 1972. The net migration rates between 1973 and 2003 fluctuated within the range between -0.04% and 0.11%. Thus, it was the natural increase that generated most of the demographic changes in postwar Japan.

Figure 4 shows changes in Crude Birth Rate (CBR) and Crude Death Rate (CDR), which difference gives the natural increase rate. CBR fell very rapidly from 33.0 per thousand in 1949 to 19.4 in 1955. This was the first completion of demographic transition in Asia and was very unique at that time in terms of its speed as well as that it was completed under the poor economic condition (Obuchi and Morioka, 1981, pp. 197-198). Under the fear of overpopulation, induced abortion for economic reason was permitted in 1948. The government started family planning program in 1952. It was estimated that induced abortion played more important role than contraception for fertility decline until the mid-1950s (Population Problems Research Councils et al., 1988, pp. 48-49).

The postwar baby boom cohort born between 1947 and 1949 started childbearing around 1970. Because of this “echo” of the first baby boom, CBR recovered from 16.9 in 1961 to 19.4 in 1973. This second baby boom caused the recuperations in population growth (Figure 2) and in natural increase (Figure 3).

There were several years in the late 1950s when population growth or natural increase rates were less than 1%. Between 1967 and 1975, however, both rates were over 1.1%. There was a sudden fall of both rates in Hinoeuma year of 1966. A superstition that a girl born in this year will be evil depressed CBR as low as 13.7 per thousand. In the next year, however, Japanese population exceeded 100 million.

Although the second baby boom was caused mainly by the growing number of mothers, there also was a small increase in net fertility. Figure 5 shows trends in TFR and replacement level. The replacement level of TFR is simply the ratio of TFR to Net Reproduction Rate (NRR). Under the mortality in 1947, TFR of 2.71 was necessary to sustain the population. Under the low mortality of today's Japan, TFR of 2.07 is sufficient for replacement. Between 1957 and 1964, TFR stayed in the range from 1.96 to 2.11 and were below replacement level. After Hinoeuma of 1966, TFR went back to 2.13 which was the replacement level at that time.

In the second half of the 1970s, CBR and TFR started falling again. Because of the continuous decline in TFR, the third baby boom expected in the 1990s was not materialized. The TFR of 1.57 in 1989 was shocking because

1.58 in Hinoeuma year was so abnormal that no one anticipated that TFR goes lower than this level. However, TFR decline continued further and entered lowest-low level with 1.29 in 2003. Taiwan also crossed the line with TFR of 1.24 in this year, while Korea already had reached the line with 1.30 in 2001 (Department of Statistics in Taiwan; Korea National Statistics Office).

As can be seen in Figure 4, CDR started rising in the late 1980s. This change was due to the compositional effect of population aging, and age-specific mortality rates have been falling continuously. As shown in Figure 6, life expectancies of male and female kept growing even after the 1980s. Recently, Japan is famous for its longest life expectancy in the world. It was shown that Japan is characterized by lower risk of heart disease than other developed countries (Kono, 2000. p. 76).

While the total population exceeded 120 million in 1984, the population growth late fell constantly. The growth rate of 1.03% in 1975 declined to 0.50% in 1985, 0.30% in 1992, and 0.11% in 2001. The current situation of demographic balance sheet is thought to be very close to zero population growth. In fact, The Vital Statistics between January and June in 2005 recorded 31 thousand excess deaths to births. Because there were 68 thousand excess immigrations in 2003, it

is difficult to say whether the natural decrease in 2005 eventually overcomes the net immigration. In any case, we must wait the result of the 2005 census to see if population decline started in 2005, not in 2007 as foreseen in the medium variant of the official projection (NIPSSR, 2002).

While the turning point may differ from the projection, the population decline in coming several decades is a determinate destiny. According to the medium variant, the population growth rate will go down to -0.5% in 2023, and -0.8% in 2040. Japanese population will go back to 120 million in 2027, which was the size in 1984. The projected population size in 2050 is 101 million, which is about the same as in 1968. The medium variant assumes the stabilized TFR of 1.39, the sex ratio at birth of 105.5, and the mean age at childbearing of 31.1. Then, Gross Reproduction Rate (GRR) should be 1.39 * (100 / 205) = 0.68. If we assume that NRR is very close to GRR, the intrinsic growth rate should be ln(0.68) / 31.1 = -1.2%. Thus, the predicted population growth rate of -0.86% in 2049 is not the final value.

1-2. Sex and Age Structure

Eastern Asian countries with Confucian tradition have been showing abnormally high sex

ratio at birth. This pattern emerged in the 1980s when prenatal sex identification, especially with ultrasound method, became available (Park and Cho, 1995, p.66; Hayashi, 2002, pp.27-34; Poston and Glover, 2005, p. 7). Recent figures are 118 in China (2001), 110.6 in Taiwan (2004) and 108.7 in Korea (2004).

Unlike these countries, Japan has been showing normal sex ratio at birth. As can be seen in Figure 7, sex ratio at birth in the postwar Japan fluctuated within the range between 104.8 and 107.6. The official projection by NIPSSR (2002) applies a fixed ratio of 105.5 throughout the projection period. As a result, the future change in sex composition of total population is very predictable. As Figure 7 indicates, the sex ratio of total population declines as population ages because there are more women than men in old ages.

There is a strange custom started by United Nations (1956) that population aging is measured with multiples of 7%. Following this criteria, the proportion of 65 years and older in Japan reached 7% in 1970 and 14% in 1994. As shown in Figure 8, the proportion will rise rapidly by 2015 and then will slow down because baby bust cohorts start crossing the line. The medium variant of NIPSSR (2002) predicts that the proportion will reach 21% in 2007, 28% in 2021, and 35% in 2047. Ishikawa (2004) estimates that the proportion of 65 years and

older in a two sex stable population will be 36.36% if age-specific fertility and mortality rates in 2003 are held constant. Thus, the predicted proportion of 35.65% in 2050 is close to the eventual value.

Figure 9 presents the child dependency ratio defined as the ratio of population under 15 to that between 15 and 64, and the elderly dependency ratio defined as the ratio of population over 65 to that between 15 and 64. The sum of these two ratios is the total dependency ratio. The decline in total dependency ratio due to fertility decline is called “demographic gift” or “demographic bonus” (Mason, 2001, p. 9). While Japan enjoyed demographic bonus between 1970 and 1990, the rapid population aging started elevating the total dependency ratio after 1990. According to NIPSSR (2002), the elderly dependency ratio of 25.5% in 2000 will grow promptly to 50% in 2030 and to 66.5% in 2050. The total dependency ratio in 2050 implies that there will be 87 consumers for 100 producers, compared with 47 consumers today.

Figure 10 displays the increase and compositional change in the elderly population. The absolute number of the elderly population will grow very fast by 2015 and then will slow down. The absolute number of the population over 65 will be 32.8 million in 2015, which is 48.7% larger than 22 million in 2000. This

implies that the population change induces 2.6% annual increase in public pension expenditure between 2000 and 2015. While the total population of Japan will start declining around 2007, the elderly population will not decline until 2043. The younger part of the elderly, aged between 65 and 75, will decline after 2015 when the baby boom cohort shift to the older part of the elderly. The proportion of the older part, age 75 years and older, will grow from 40.9% in 2000 to 60.3% in 2050. Thus, aging of the aged is under the process.

Figure 11 shows the decline and compositional change in the working age population. The medium variant predicts that the population between 15 and 64 will be 53.9 million in 2050, which is 37.6% smaller than 86.4 million in 2000. This implies that, under the constant capital and technology, the population change will induce negative economic growth of -0.9% annually between 2000 and 2050. While the proportion of young workers between age 15 and 24 decreases and that of older workers between age 50 and 64 increases, that of central workers between age 25 and 49 is held constant. The decline in the absolute number of central workers between 2000 and 2050 will be 38.1%, which is close to that of total working age population. Such a fall in labor supply of skilled young workers is very problematic under the rapid technological development and globalization (McDonald, 2005, p. 1).

Chapter 2. Recent Fertility Decline and Its Determinants

2-1. Cohort Fertility

Complete Fertility Rate (CFR) of a real cohort is a more desirable measure than TFR, because the latter suffers from tempo distortion and parity composition effect (Ortega and Kohler, 2001). The problem is that CFR cannot be determined until the cohort completes its reproduction. However, CFR of cohorts in age forties is predictable because only a small number of births will be added to the current level. Figure 12 displays cumulative fertility relative to that of the 1950 cohort, using the scheme by Frejka and Calot (2001). Although the 1955 cohort was behind its predecessor in early twenties, it succeeded in catch up and will fulfill a near replacement level. However, a significant decline in CFR for cohorts born after 1960 seems to be inevitable. Cumulative fertility of the 1960 cohort is 1.84 at age 43 and will not reach 1.9 eventually. Though it is difficult to predict CFR for cohorts born after 1965, the postponement in early twenties seems too serious to be compensated later. Thus, CFR of younger cohorts in Japan can be as low as 1.6, which is predicted for Italian cohorts (Frejka and Calot, 2001, p. 112; van Imhoff, 2001, p. 55).

2-2. Period Fertility

In many countries with very low fertility, there is a secular trend of postponement in childbearing. This is also the case in Japan. Figure 13 presents the mean ages at childbearing by birth order between 1984 and 2003[1]. The mean age at all births rose from 28.1 in 1984 to 29.6 in 1997. Then, the change stagnated toward the turn of century. However, the delay was accelerated again and the mean age rose to 29.8 in 2003. This reacceleration was caused by the delay in the first birth, which age jumped from 28.0 in 2001 to 28.3 in 2003.

Such a postponement in childbearing causes "tempo distortion" that TFR is depressed to an undesirably low level. Bongaarts and Feeney (1998) proposed a measure to remove tempo distortion from TFR. Their ATFR (Adjusted Total Fertility Rate) is a hypothetical TFR that would materialize if there were no delay in childbearing. In the following, $f(x,i)$ is age-specific fertility rate of birth order i, and r_i is annual rate of change in the mean age at childbearing. The overall ATFR is simply the sum of order-specific $ATFR_i$.

[1] The mean ages are based on age-specific fertility rates and are different from the official figure in vital statistics which is based on the number of births.

$$TFR_i = \sum_x f(x,i), \quad ATFR_i = \frac{TFR_i}{1-r_i}.$$

Although they declared afterward that their ATFR is neither an estimate nor a prediction of cohort fertility (Bongaarts and Feeney, 2000, p. 560), their first illustration was based on the concept of completed fertility of a birth cohort. Thus, many problems were pointed out when the ATFR is seen to be a measure of cohort fertility (van Imhoff and Keilman, 2000; Kim and Schoen, 2000; Inaba, 2003). However, Kohler and Philipov (2001) proved that an adjustment of TFR can be defined without referring to cohort fertility at all, and Zeng and Land (2001) demonstrated the robustness of the ATFR. As far as it is not misunderstood to be a measure of cohort fertility, the ATFR should be a valid measure of period fertility being removed the effect of delay in childbearing.

Another deficit of TFR is that it is based on "incidence rates" that do not refer to the population at risk. Define that $K(x,i)$ is the female population of age x and parity i Define also that $B(x,i)$ is the number of births by women of age x and parity i. The theoretically desirable occurrence / exposure ratio is called "intensity" of birth (Ortega and Kohler, 2001, p. 4) and defined as follows;

$$m(x,i) = \frac{B(x,i)}{K(x,i)}.$$

On the other hand, incidence rate does not consider the parity distribution of female population and is calculated as follows;

$$f(x,i) = \frac{B(x,i)}{K(x)} = \frac{B(x,i)}{\sum_i K(x,i)}.$$

While incidence rates are easily obtained, intensities are more difficult especially in Japan where the census does not include a question on children ever born. Here, parity distributions are estimated by tracing fertility behavior of each cohort. Once a set of intensities in a given year is obtained, a multi state life table that depicts the parity progression of a hypothetical cohort can be created. Then, one can calculate the mean number of children using the eventual parity distribution in this life table. Here, such a measure of fertility is called PAP (Period Average Parity)[2] and compared with TFR and ATFR.

Figure 14 shows these three indices of fertility. The difference between

[2] Rallu and Toulemon (1993) called this measure PATFR (Parity and Age Total Fertility Rate). TFRPPR (TFR based on Parity Progression Ratio) by Feeney (1986) is also a closely related measure.

TFR and PAP, which is the parity distribution effect without tempo adjustment, is very small in Japan. While the proportions of parity zero and one are rapidly increasing, such a change does not result in a deceptive fall in TFR. The difference between TFR and ATFR is the tempo distortion based on incidence rates. The distortion continuously diminished by 2001 and then expanded again due to the reacceleration in postponement.

Figure 15 displays the change in the eventual parity distribution from which PAP is calculated. The proportion of parity zero increased from 14.2% in 1984 to 30.7% in 2002. Thus, approximately one third of women will stay eventually childless if the current pattern of parity progression is held constant. The proportion of parity one also increased from 16.2% in 1984 to 21.6% in 2002. As a result, the proportion of parity two and more reduced considerably.

If P_i is the eventual proportion of parity i, the parity progression ratio from i to $i+1$ is defined as follows;

$$PPR_i = \frac{P_{i+1} + P_{i+2} + \cdots}{P_i + P_{i+1} + P_{i+2} + \cdots}.$$

Then, PAP can be expressed with parity progression ratios as follows;

$$PAP = PPR_0 + PPR_0PPR_1 + PPR_0PPR_1PPR_2 + \cdots$$

Table 1 shows a decomposition of PAP change between 1984 and 2002 into parity progressions. The contribution of a particular parity progression was evaluated by calculating hypothetical PAP using PPR_i of 2002 for the given i while using PPR_j of 1984 for other parities. This hypothetical PAP would materialize if there were no change in parity progression other than the given i. This simple method produces the residual.

The actual PAP decline between 1984 and 2002 was 1.79 – 1.31 = 1.48. In this total change, the decline in parity progression from zero to one should have caused PAP reduction by 0.35 (71.8%). This gives the maximum contribution of nuptiality decline. If the increase in childlessness were caused solely by nuptiality decline, marriage would explain approximately 70% of fertility decline in Japan. If, however, there were an increase in childless couples, the contribution of marriage would be significantly lower than 70%. In any case, nuptiality decline does not explain 100% of fertility decline. The fall in the probability having the second child also has significant effect, though it is smaller than that of the first child.

2-3. Nuptiality

Extramarital births are very seldom in Japan, accounting for only 1.93% of all births in 2003. Thus, fall of nuptiality directly results in that of fertility. Figure 16 compares TFR and female TFMR (Total First Marriage Rate) between 1984 and 2003. TMFR is an estimate of the proportion ever married at age 50 of a hypothetical cohort without death. This proportion dropped more moderately than TFR. While TFR fell by 28.7% during this period, TFMR of Japanese women fell only by 14.3%.

Figure 17 presents female mean age at first marriage and at first childbearing. As mentioned above, the delay in first birth stagnated around 2000 and then accelerated again. This change was not wholly attributable to the change in marriage timing but there was a change in fertility behavior of newly wed couples. In addition to the fall in quantum and delay in timing of first marriage, crude divorce rate rose from 1.28 per thousand in 1990 to 2.25 per thousand in 2003.

The contribution of nuptiality to fertility was conducted using AMFRs (Age-specific Marital Fertility Rates) until the mid 1990s in Japan (Atoh, 1992, p.

51; Kono, 1995, pp. 67-71; Tsuya and Mason, 1995, pp. 147-148; NIPSSR, 1997, p.10). If $f(x)$ is the ordinary age-specific fertility rate (incidence rate) and $N(x)$ is the proportion of currently married women, AMFR is defined as follows;

$$AMFR(x) = \frac{f(x)}{N(x)}.$$

Decomposition analysis using AMFRs is especially risky when there is a secular trend of marriage postponement. Because marital fertility is dependent on marriage duration as well as on age, decomposition using AMFRs is severely squeezed by compositional changes in marriage duration within an age interval. Hirosima (2001) approached this problem with simulations and Suzuki (2004) gave a general mathematical model. The model follows the scheme by Inaba (1996) and assumes that marital fertility $m(a,y)$ is dependent on age at marriage a and marriage duration y. If female age-specific first marriage rate is written $n(a)$, the ordinary age-specific fertility rate can be expressed as follows;

$$f(x) = \int_{\alpha}^{x} n(a)\, m(a, x-a)\, da.$$

It is assumed that there is no divorce or death until the end of

reproductive ages. Then $N(a)$, integral of $n(a)$, is the proportion of currently married women. It is also assumed that $n(a)$ has a unimodal pattern and $n(a)$ / $N(a)$ decreases monotonously in terms of a, and that $m(a,y)$ decreases monotonously in terms of a and y. Under these assumptions, many undesirable features of AMFRs become apparent. Firstly, an AMFR does not express the level of genuine marital fertility. Because $f(x)$ is an integral of product of $n(a)$ and $m(a,y)$, division with $N(a)$ does not separate $m(a,y)$ from $f(x)$. Secondly, a decomposition analysis using AMFRs fails under the postponement of marriage. If the age pattern of $n(a)$ is shifted horizontally while $m(a,y)$ is held constant, the contribution of marital fertility to TFR decline should be zero. However, decomposition with AMFRs gives a result that the contribution of marital fertility is larger than the (negative) change in TFR. Thirdly, AMFRs can rise in most of the reproductive ages if $m(a,x\text{-}a)$ increases in terms of a. Finally, AMFRs can increase even when $m(a,y)$ is declining in all ages.

Decomposition analysis using AMFRs always tells that the recent fertility decline in Japan was caused solely by nuptiality decline and that marital fertility played no significant role. However, such a result is not reliable because of the deficits in AMFRs. More sophisticated methods have been showing very different

results. Hirosima (1999) used the proportion of eventually married women and the complete average number of children among married women to decompose the effects of nuptiality and marital fertility. For TFR decline between 1974 and 1997 (from 2.05 to 1.39), 24.3% was attributed to the quantum of marriage, 36.5% to the quantum of marital fertility, and remaining 39.4% to tempo distortion. Hirosima (2000) attempted to decompose the effect of tempo distortion to marriage and childbearing. His result shows that quantum and tempo of marriage account for approximately 70% of TFR decline between 1970 and 2000 (from 2.138 to 1.386), while those of marital fertility explains 30%. Ogawa (1998) decomposed the fertility decline between 1990 and 1995 measured with parity progression ratios and found that a little less than 40% is explained by nuptiality decline. Kaneko (2004) adjusted AMFR by shifting age-specific fertility rates $f(x)$ in accordance to the delay in marriage. He concluded that 73.7% of TFR decline between 1980 and 2000 was caused by nuptiality decline. Iwasawa (2002) introduced the eventual average number of children by age at marriage to decompose the decline in cohort cumulative fertility. Converting estimated cohort fertility to period fertility, she had a similar result with Hirosima (2000) that approximately 70% of TFR decline between 1970 and 2000 was due to nuptiality

decline. Suzuki (2005) applied a simplified method of Iwasawa to Japan and Korea, assuming that marital fertility does not depends on the age at marriage but solely on marriage duration. The result showed that 37% of TFR decline between 1990 and 2002 in Japan (from 1.54 to 1.32) was explained by nuptiality decline.

As a whole, nuptiality decline explains between 35% and 75% of TFR decline, depending on the period in question. Thus, it is safe to say that both nuptiality and marital fertility have contributed to the recent fertility decline in Japan, and that relative importance varies over time.

2-4. Proximate Determinants

Since marriage does not explain whole part of the fertility decline, there should be proximate determinants (Bongaarts, 1978) that caused a significant fall in marital fertility. However, neither contraception nor induced abortion is responsible for it. As shown in Figure 18, the proportion of currently married women practicing contraception was 55.9% in 2000 and was lower than in the early 1990s. This considerably low level of contraception practice is attributed to a heavy bias to mail methods (Atoh, 2000, p. 108). Condom accounts for 75.3% of all contraceptive methods (multiple answers) in 2000, while pill and IUD

account for only 4.2%. It was as late as in 1999 that low dose pill was legalized in Japan. Because an expansion of STD was worried about, the access to low dose pill is still limited and a prescription is required. As a result, the practice of contraception increased only slightly after the permission.

There is no evidence on an increasing number of unwanted pregnancies. As shown in Figure 18, the ratio of abortions to births dropped in the early 1990s and sustained the low level under 30%. In 2003, there were 319,831 cases of induced abortion operations and the ratio to births was 28.5%. This means that, in Japan, approximately two in nine pregnancies end in abortion. However, the trend does not match the assessed decline in marital fertility.

As expected, the frequency of still births has been declining. There were 35,330 still births in 2003 and the ratio to live births was 3.1%. It was significantly lower than 4.9% in 1984 and 4.4% in 1990. It is said that many mothers in Japan stop breastfeeding by 1.5 years after the birth. Then, neither intrauterine mortality nor postpartum amenorrhea seems to have contributed to the recent fertility decline.

The remaining proximate determinants are frequency of intercourse and sterility. There is no time series data on coital frequency or infecundity of married

couples in Japan. It might be possible to assert that sexless couples are in increase due to the long working hours or strengthened mother-child ties. It might also be possible to hypothesize an increase in infecundity due to the rising age at marriage, environmental hormone, and sexually transmitted diseases (Semba, 2002). However, quantitative evaluations of such hypotheses will be difficult due to the lack of necessary data.

2-5. Demands for Spouse and Children

An important question on the recent nuptiality and fertility decline is whether it is a result of intentional behaviors. The second demographic transition theory (van de Kaa, 1987) emphasizes the role of value changes such as individualization and secularization. We can imagine a more radical value change toward an absolute individualism that refuses spouse or any form of partnership. However, this is not the case in Japan. Figure 19 presents the trend in marriage intention scores of single men and women less than the age 35. In each round of the National Fertility Surveys, single respondents were asked if they have an intention to marry someday. If one has an intention, he or she was asked about timing and ideal mate. According to the strength of marriage intention, scores

were assigned as follows (NIPSSR, 2004, p. 26);

0.0 No intention of marriage
0.2 Not yet and wait for an ideal mate
0.4 Not yet but at a particular age
0.6 Marry if an ideal mate appears but keep waiting if not
0.8 Marry if an ideal mate appears but stop waiting at a particular age
1.0 Want to marry within a year

Figure 19 indicates that there was an increase in intention of marriage among women between 1997 and 2002. Thus, there is no evidence in a declining demand for spouse. Actually, only 3.8% of men and 3.0% of women answered in 2002 that they have no intention of marriage. However, this demand for spouse will not be fulfilled. The medium variant of population projection (NIPSSR, 2002, p. 20) predicts that 16.8% of women born after 1985 will remain single at the age 50. This implies that (100 – 3) – (100 – 16.8) = 13.8% of women cannot satisfy their desire for marriage.igure 20 depicts changes in the ideal and the expected number of children of Japanese wives younger than age 50. The ideal number of children is the answer to “how many children do you think to be ideal for you and your husband?”. The expected number of children is the number that the couple already has plus the answer to “how many children do you and your husband plan

to have in the future?". Although there was a slight decrease in demand for children, the figures are still higher than two. In the 2002 survey, the ideal number was 2.56 and the expected number was 2.13. However, this demand will not be satisfied again. Assuming that 83.2% of women eventually marry as prospected in the medium variant, and that married women achieve the expected number of children, CFR will be 2.13 * 0.832 = 1.77. It seems to be difficult for cohorts born after 1965 to arrive at this level if we consider the slow recuperation shown in Figure 12.

After all, it is clear that lowest-low fertility in today's Japan is not due to lowest-low demand for spouse and children. According to Atoh (1997), individualistic attitude increased only moderately in Japan. Although attitudes toward gender relationship and care for the elderly parents have changed considerably, those changes have not caused a decline in demand for spouse or children. Thus, recent fertility decline should be explained not from demand itself but from obstacles to fulfill the demand. We will examine such obstacles in the following sections.

2-6. Direct Cost of Children

In the world of post-industrialization, globalization and rapid technological development, there is a growing demand for human capital investment. Thus, parents are more interested in quality of children and educational cost grows higher (Becker, 1981; Willis, 1994). The rising cost of children including public and private educational cost is thought to be the main reason of the recent low fertility in Japan. For Japanese wives whose expected number of children was lower than the ideal number, the most frequent answer was "Too much money is needed for childbearing and education" (NIPSSR, 2003, p.60).

Figure 21 depicts the change in college enrollment rate in Japan since 1980. The enrollment rose rapidly in the 1990s and was stagnated after 2000. However, the shift from junior college to college is under the process. In Japan, the governmental support to tertiary education is smaller than in other developed countries and there are many private universities (Atoh and Akachi, 2003, p. 33; Moriizumi, 2005, p. 117). Availability of scholarship is also limited. For those reasons, Japanese parents are suffering from financial cost of children more seriously than parents in other developed countries.

Human capital investments other than formal education are also in increase. Figure 22 shows the decline in IMR (Infant Mortality Rate) in Japan

since 1980. Though the pace of decline slowed down recently than in the 1980s, IMR in Japan is still decreasing. The current level of 3 per thousand is even lower than low mortality countries such as Sweden and France. Such an achievement cannot be done freely but both government and parents are paying for it. There seems to be a trend that Japanese parents become more protective and spend more money on health and education of their children.

2-7. Economic Recession and Labor Market Condition

Young people that grew up in a period of rapid economic growth tend to have high aspiration for their future lives. When the economy slows down, however, the labor market condition for the young workers becomes tight. Those who conceive the difficulty to achieve the expected standard of living will hesitate to step into marriage and childbearing (Easterlin, 1978; Yamada, 1999).

In the case of Japan, economy was bad throughout the 1990s. Unemployment rate rose sharply from 2% in 1990 to 5% in 2003. The tight labor market condition seriously discouraged the career achievement of the youth. Figure 23 shows the labor force status of college graduates immediately after the graduation. While those who obtained a stable job decreased from 77.8% in 1988

to 55.8% in 2004, those who obtained no job or a part time job increased from 9.4% to 24.6% during the same period. The proportion proceeding to higher education also increased from 6.5% to 11.8%.

According to Nagase (2002, pp. 27-28), part time work significantly reduces the hazard of first marriage of both men and women. While the hazard rapidly rises between age 24 and 27 for women working on fulltime basis, such acceleration cannot be observed for women with part time jobs. Takayama and his coauthors (2000, pp. 9-10) showed that the low income of young men relative to their fathers discouraged marriage. In the past, the income of men in age 30s overcame that of fathers and motivated women to marry them. Recently, however, the relative income of young men to old men has declined considerably and young men are less attractive as marriage partners than before.

The poor economic performance in recent Japan has depressed not only nuptiality but also marital fertility. The positive effect of husband's income on marital fertility has been identified repeatedly (Yamagami, 1999; Fujino, 2002; Oyama, 2004). In this connection, the wage index in The Monthly Labor Statistics Survey dropped by 6.7% points between 1997 and 2003. The economic recession is thought to have affected not only through income level itself but also through

the expected income in the future. Figure 24 shows a result of an opinion survey conducted by the Cabinet Office asking expectation on one's future life. In the late 1980s and the early 1990s, there were more respondents who answered "(my life) will go better" than those who answered "will go worse". During the 1990s, however, the answer "worse" continuously increased to overcome "better" around 1995. In June, 2005, the pessimistic attitude surpassed the opportunism by 18% points. It is thought that such uncertainty toward the future is one of the major sources of lowest-low fertility in recent Japan.

2-8. Female Labor Force Participation and Gender Roles

According to Becker (1991, pp. 350-354), the main cause of family changes since the latter half of 20th century was the rising economic power of women. The expanding occupational opportunity for women increased the time spent on market activities and raised the opportunity cost of children. The declining return from gender-based division of labor reduced the merit of marriage and promoted the rise in divorce rate. These changes resulted in the increase in female-headed households, cohabitations, and extramarital births.

The theory predicts the negative impact of female labor force

participation on fertility. Actually, there are numerous empirical evidences of such a negative effect of wife's work on fertility at micro level (Asami et al., 2000; Oi, 2004; Oyama, 2004; Sasai, 1998; Shichijo and Nishimoto, 2003; Tsuya, 1999; Nagase, 2004; Fukuda, 2004; Fujino 2002; Yashiro, 2000; Yamagami, 1999; Yamaguchi, 2005). At macro level, however, the correlation between female labor and fertility among developed countries turned from negative to positive in the 1980s (Engelhardt and Prskawetz, 2005, pp. 2-3; Billari and Kohler, 2002, pp. 20-21; Atoh, 2000, p. 202).

Figure 25 traces the labor force participation of women aged between 25 and 34 and TFR of four countries in 1985, 1990, 1995, 2000 and 2002. While France and Sweden stayed upper-right area (high participation and moderately low fertility), Japan and the Republic of Korea shifted from upper-left (low participation and moderately low fertility) to lower-central area (medium participation and lowest-low fertility). It seems that the main reason for the aggregate reversal in the cross-country correlation was the down-right movement of lowest-low fertility countries in Southern and Eastern Europe, the former Soviet Union and Eastern Asia. Such a movement implies that there is a serious conflict between the work of married women and childbearing in countries

suffering lowest-low fertility.

In Japan, the incompatibility between female labor and fertility is expressed in M-shaped curve of age-specific participation rates (Figure 26). Although M-shaped curve can be seen also in Korea and New Zealand, the drop between age 25-29 and age 30-34 is steepest in Japan (Furugori, 2003, p. 48). Thus, many Japanese women have ability and opportunity to work but they have to give up their career at childbearing. Such incompatibility is attributed to remaining gender role attitude, low participation of husband in housework, characteristics of labor market, and underdevelopment of family friendly policy (Atoh and Akachi, 2003, p. 35; Meguro and Nishioka, 2000).

As far as the gender equity is concerned, Japan is among the lowest in the developed world. The Human Development Report published by the United Nations Development Programme (UNDP) includes Gender Empowerment Measure (GEM), which indicates female representation in the legislature, occupation and income. Japan's score was 0.534 in 2005 and was 25th among 28 OECD member countries. Japanese husbands spend considerably shorter time in housework than the US husbands (Tsuya and Bumpass, 2004) or Scandinavian husbands (Tsuya, 2003, p. 63). The Survey on Time Use and Leisure Activities by

the Statistics Bureau shows that there was little change in husband's participation in housework between 1981 and 1996 (Atoh, 2000, p. 205).

However, the "double shift" of working wife who takes charge of both work and housekeeping has been lightened. The survey mentioned above classifies three types of activities. The primary activities include human basic needs such as sleeping and eating. The secondary activities are occupational work, schoolwork, housekeeping, childcare and shopping and correspond to basic economic and social needs. The tertiary activities are leisure activities such as mass media contact, hobbies, sports, social life, etc. Figure 27 displays the change in hours spent on the secondary activities on a weekday. By the early 1990s, working wives spent considerably longer time than their husbands on employment and housework combined. This "double shift" reduced during the 1990s and there remains very small difference in 2001. However, this advancement in domestic gender equity does not seem to have contributed to fertility in Japan. The increase in time available to housework was brought about by the decline in working hours of both husband and wife. It seems that the antinatal effects of reduced income and growing uncertainty were larger than the pronatal effect of available time.

Chapter 3. Governmental Policy Interventions

3-1. Development of Policy Measures

Table 2 shows the chronological development of pronatal policies in Japan. The Japanese government was surprised by the historically low TFR of 1.57 in 1989 and started an inter-ministry meeting to invent measures to cope with the declining fertility in 1990. The amount of child allowance was raised in 1991, while the period of payment was shortened to keep the budget. The Childcare Leave Law (formally “Law Concerning the Welfare of Workers Who Take Care of Children or Other Family Members Including Child Care and Family Care Leave”) was established in May 1991 and enforced in April 1992.

In December 1994, the government publicized the Angel Plan for the quinquennial period between 1994 and 1999. The program emphasized the compatibility between work and childcare and public support of childrearing. As a part of this program, amendments to the Childcare Leave Law were made to support income and exempt from payment of social security premium in 1994. In 1997, a major reformation was made to the Child Welfare Law to provide with satisfactory daycare services for working mothers. After a long discussion on

reproductive health and sexually transmitted diseases, low-dose contraceptive was approved in 1999.

In December 1999, the government made the New Angel Plan for the period between 1999 and 2004. This document asserted the need to improve the gender equity and working condition. In May 2000, amendments were made to the Childcare Leave Law and the Child Allowance Law. It was decided that 40% of wage should be paid during the leave. Child allowance was expanded from less than three years old defined in the 1991 revision to preschoolers.

The Ministry of Health, Labour and Welfare announced the Measures for Decreasing Children Plus One in September 2002. The document proposed that local governments and private companies should invent their own plan to support bearing and rearing of children. This proposal was accepted in the Next Generation Law enacted in July 2003. Local governments and large companies were demanded to submit their own programs to foster new generations. At the same time, the Law for Measures to Cope with Decreasing Children Society ordered the Cabinet Office to prepare new measures to prevent the rapid fertility decline. An expansion of child allowance to the third grade of primary school was enforced in April 2004.

In December 2004, the government declared the New-New Angel Plan for the period between 2004 and 2009. The document emphasized the role of local government and companies in providing with childcare supports and improving gender equity. In addition, the document pointed out the importance of economic independence of the youth. Thus, anticipated measures may include introducing papa-quarter in childcare leave, supporting companies to create daycare room within office, and promoting trial employment of young workers.

In spite of all the policy interventions taken so far, TFR of Japan has been declining. It is true that Japan has been slow in developing family policies and the state of family friendliness is far behind the welfare nations in Northern and Western Europe. Gauthier classified Japan to “Liberal Regime” together with Switzerland and English speaking developed countries (the United Kingdom, the United States, Canada, Australia and New Zealand). The type is characterized by a low level of support for families (Gauthier, 2002, p. 453). Fukuda’s cluster analysis grouped Japan with Italy, Spain, Portugal, Greece, Netherlands and Finland. This “Southern European” type shares such features as poor daycare service for children less than two years old, low income benefit during the leave, and small tax relief for families with children (Fukuda, 2003, pp. 20-21). In terms

of the governmental expenditure on support for families as ratio to GDP, Japan formed the lowest group with the Republic of Korea, the United States and Spain. These countries were the lowest also in terms of the growth in the expenditure on families (Katsumata, 2003, p. 20).

3-2. Child Allowance and Tax Relief

Child Allowance of Japan started in 1971. At that time, only children of the third and higher order, less than five years old, and their parents did not exceed the income threshold were eligible. The birth order limit was loosened to the second order in 1985 and to the first order in 1990. Age limit was raised to all preschoolers in 1974 but lowered again to three years old in 1985 (Oishi, 1999, p. 39). The income threshold is still maintained.

Since 1992, 5,000 yen per month for the first and second children and 10,000 yen for higher order children have been paid. Until May 2000, only children less than three years were eligible. Between June 2000 and March 2004, the age limit was raised until the entrance to primary school but means test was tightened. From April 2004, the age limit was raised further until the end of the third year of primary school, namely until March of nine years old.

It is too early to evaluate the effect of the latest expansion on fertility. Before the latest change, 6,880,786 children were receiving child allowance on 28 February, 2003 (NIPSSR, 2005, p. 170). This was about 85% of the preschooler population. Thus, about 15% of children were eliminated because of high income of their parents.

Figure 28 compares the child allowance of Japan with France and Sweden. The height of each rectangle expresses monthly amount of the allowance per family with two children and the width gives the number of beneficial years. In Japan, 5,000 yen (approximately 36 euro) is paid to each child until the child finishes the third year of primary school. In France, the family allowance is offered to families with two children or more. In the case of a family with two children, 112.59 euro is paid per month while the second child is less than 20 years old (Economic and Social Research Institute, 2005). In Sweden, 950 krona (100 euro) is paid per month per child under 16 years old (METI, 2005). There is no income threshold in France and Sweden.

Child allowance with income threshold as in Japan can be found in Southern Europe. Non-European English speaking countries such as the United States, Canada and New Zealand do not have child allowance system and support

families with children only through tax relief (Atoh and Akachi, 2003, pp. 42-43). In Japan, the tax exemption for a dependent child has been maintained since 1950 and played more important role than child allowance (Atoh, 2005, pp. 38-39). However, the adjustment effect of taxation in Japan is about the same as in Southern Europe (Fukuda, 2003, pp. 17-19).

Yamagami (1999, p. 59) stated that monthly allowance of 200,000 yen is necessary to elevate TFR by 0.6. This came from his partial regression coefficient that an increase in husband's annual income by 10 thousand yen would raise the number of children by 0.00244. Thus, the current level of 5,000 yen per month will increase children by 0.00244 * 0.5 * 12 = 0.01464 and 10,000 yen per month will increase by 0.00244 * 1 * 12 = 0.02928. In 2003, 13.8% of births were the third and higher order. Then, 0.01464 * (1 – 0.138) + 0.02928 * 0.138 = 0.0167 children would be lost if there were no child allowance in Japan. On the other hand, estimates by Oyama (2004, pp. 52-53) showed that a rise in husband's monthly income by 10,000 yen would raise the number of children by 0.01. In this case, 0.01 * 0.138 + 0.005 * (1 - 0.138) = 0.0057 children would be lost if there were no child allowance. The effect could be even smaller if we consider the age limit, because no allowance is made while a child is enrolled in a high school or a

college.

Under the current taxation system, a parent with a dependent child less than age 16 is exempted 380,000 yen from income tax and 330,000 yen from local taxes. A parent with a dependent child aged between 16 and 22 is exempted 630,000 yen and 450,000 yen, respectively (Atoh, 2005, p. 45). It is assumed that tax rates for an average parent are 20% for income tax and 10% for local taxes. If there were no tax relief, 630 * 0.2 + 450 * 0.1 = 171 thousand yen will be lost for a parent with a dependent child between ages 16 and 22. Applying the coefficient by Oyama, TFR would drop by 17.1 * 0.01 / 12 = 0.0143 if there were no tax relief. The coefficient by Yamagami implies that the loss would be 17.1 * 0.00244 = 0.0417.

3-3. Maternity Leave and Childcare Leave

Maternity leave in Japan was defined legally in 1926. Under the current Labor Standard Law, a female worker can have 14 weeks leave at childbearing. She receives 300,000 yen from a public health insurance system. This is supposed to cover the cost at a hospital. In addition to this one time cash benefit, a mother can receive 60% of wage during the maternity leave if she has worked at least for

one year. According to the National Fertility Survey in 2002, 67.3% of mothers used maternity leave. Among mothers who were regularly employed on the survey date, 87.9% used the leave. As expected, the rate was lowest in small companies and highest in governmental agencies (NIPSSR, 2003, p. 90).

Figure 29 compares maternity leave in Japan, Korea, France and Sweden. Japan's cash benefit and length of maternity leave is close to the lowest level of developed countries (Fukuda, 2003, pp. 9-10; Atoh and Akachi, 2003, pp. 36-39). The Labor Standard Law in Korea states that a female worker during maternity leave should be seen at work. In France, a female worker bearing the second child is allowed to leave for 16 weeks and is paid 84% of wage. Maternity leave is integrated with parental leave in Sweden and 80% of wage is paid for 390 days. A female worker must take maternity leave at least for eight weeks.

The childcare leave was approved in the Diet of Japan in May 1991 and enforced in April 1992. Although the law allowed a female worker or her husband to leave until the first birth day of their child, there was no cash benefit at that time. The amendments in June 1994 legalized cash benefit of 25% of wage and exemption from social security premium during the leave. These revisions were enforced in April 1995. The amendment in November 2001 raised the cash benefit

to 40% and was enforced in April 2002. Under the current system, 30% is paid monthly during the leave and 10% is paid after returning to job. Although the leave is basically allowed until the first birthday of a child, public servants can leave until the third birthday. Other workers can prolong the leave for six months if daycare center is not available. However, no cash benefit is paid in both cases for the prolonged period.

According to the Basic Survey of Employment Management of Women in 2003, 73.1% of female workers who gave births in the fiscal year 2002 took childcare leave. However, many women retire from work before childbearing and are not included in the denominator (Atoh, 2005, p. 46). A female worker who was not continuously employed for a year or who does not plan to come back to her job is also excluded. There were 103,478 cases that received cash benefit during childcare leave in 2003 (NIPSSR, 2005, p.381). This was only 9.2% of the number of annual births. Thus, only 0.092/0.731 = 12.6% of mothers were eligible for childcare leave. According to the national fertility survey, more than 70% of wives born after 1960 were employed on regular basis before marriage (NIPSSR, 2003, p. 79). Then, it is estimated that approximately 60% of women gave up their work at marriage or childbearing and became ineligible for childcare leave.

In Japan, it is very rare that a father takes childcare leave. The Basic Survey of Employment Management of Women showed that 0.44% of male workers whose wife gave a birth in the fiscal year 2002 took childcare leave. Although the Measures for Decreasing Children Plus One in 2002 declared that 10% of male workers should take childcare leave, a dramatic change in labor climate will be required to achieve this goal.

Parental leave is available in France until the third birthday of a child and approximately 500 euro (70,000 yen) is paid monthly, if the parent has two or more children (Economic and Social Research Institute, 2005). In Japan, a mother during childcare leave received on average 48,500 yen per month in 2003 (NIPSSR, 2005, p. 381). Since this is 30% of wage, the average wage is estimated to have been approximately 160,000 yen. Thus, cash benefit during parental leave in France is equivalent with 43% of wage in Japan. In Sweden, maternity leave is included in parental leave. Swedish system is so flexible that parents can take leave for 480 days until the eighth birthday of a child. Cash benefit of 80% of wage is paid for 390 days and the minimum benefit is paid for 90 days (METI, 2005). In Korea, childcare leave is allowed until the first birthday of a child as in Japan. Monthly cash benefit is 400,000 won (40,000 yen), which is 25% of the

average wage of Japanese mothers.

Figure 30 compares childcare leave (parental leave) of four countries. Countries that provide a certain proportion of wage can be found mainly in Northern Europe. As expected, cash benefit of Japan is considerably lower than these countries including Sweden. However, Japan's system is more generous than many Southern European and English speaking countries. While France, Germany and Spain allow three years for parental leave, there are many European countries where the leave is shorter than a year. Japan falls around the median length of parental leave in Europe (Fukuda, 2003, p. 13).

There are several studies that evaluate the effect of childcare leave on fertility in Japan. Table 3 shows partial regression coefficients in four studies. Since each coefficient b is supposed to show a log-odds ratio of fertility between a female who can take childcare leave and who cannot, $\exp(b)$ gives a odds ratio. Because Shigeno and Matsuura (2003) and Yamaguchi (2005) analyzed fertility of five-year period, $\exp(b/5)$ is shown in the table. If we express the average fertility rate of female who cannot take childcare leave with f_0 and that of who can take with f_1, an odds ratio is;

$$\exp(b) = \frac{f_1}{1-f_1} \Big/ \frac{f_0}{1-f_0}.$$

If the proportion of women who can take childcare leave is expressed with p, then TFR can be written as follows;

$$TFR = 35\{(1-p)f_0 + pf_1\}.$$

The multiplier 35 comes from the length of reproductive period. The expressions above give the following quadratic equation of f_0.

$$(1-p)(1-e^{-b})f_0^2 + \{p + (1-p)e^{-b} - \frac{TFR}{35}(1-e^{-b})\}f_0 - \frac{TFR}{35}e^{-b} = 0.$$

Though the expression is a little messy, it is possible to determine the value of f_0 if one gives adequate value for each parameter. In Table 3, TFR=1.29 and p =0.092 were applied. If there were no childcare leave in Japan, TFR would be lower than today by 0.0027 or 0.0277. While Suruga and Nishimoto (2002) used Basic Survey of Employment Management of Women by the former Ministry of Labour, other three studies used Japanese Panel Survey on Consumers by the Institute for Research on Household Economic. Thus, the difference in magnitude seems to come from the difference in data source. One can easily

evaluate the effect of childcare leave availability by applying various *p* and comparing hypothetical TFR with the current level. An example will be given below.

3-4. Childcare Service

Compatibility between female work and childrearing has been the primary political goal of Japanese government. The Angel Plan announced in 1994 had “support for simultaneous child rearing and work” at the top of its list. In accordance to this guideline, a major revision was made to The Child Welfare Law in 1997 and public daycare service turned from the municipality assignment system (administrative measures) to a system to allow parents to select their preferred daycare center. The New Angel Plan in 1999 sustained the emphasis on compatibility. The cabinet adopted “Zero Waiting List for Daycare Program” as a political goal in July 2001. The governmental effort was partially successful at least in very recent years. According to the Children and Families Bureau, the number of children on the waiting list decreased from 26,383 in 2003 to 23,338 in 2005. However, daycare service is still less available in Japan for very early childhood. Of 23,338 children on the waiting list, 15,831 (67.8%) was under two

yeas old. This accounts for 0.47% of population under age two.

There were 632,011 children under age two (18.6% of population) in daycare center in April 2005. As shown in Figure 31, the proportion enrolled in daycare service has been increasing gradually in Japan. Since the proportion was 13.4% in 1998, there was an increase by 5.2% point by 2005. However, childcare service in Japan seems to be still far behind Northern and Western Europe, although trends in Sweden, France and Korea are not available in this graph. While Sweden relies on public childcare service, France has a diversified system including public service, support for registered childminders, and tax deduction for the use of private childminders (Neyer, 2003, p. 64). Korea is under a major reconstruction of childcare policy including amendments to the Infant and Child Care Law and transferring jurisdiction from the Ministry of Health and Welfare to the Ministry of Gender Equity and Family (Seo MH, 2004). According to Choi EY (2004, p. 30), the enrollment rate was 14.1% in 2003, which was close to 17.0% in Japan.

The simplest measure of compatibility between wife's work and childbearing would be the proportion of working mothers among all wives. Actually, this measure is the key to understand the micro-macro paradox of the

relationship between fertility and female labor force participation. Let g be the proportion of working mothers, m be that of all mothers, and w be that of all workers. Then, a two by two contingency table can be written as follows;

	Not Mother	Mother	
Not Worker	$1 - w - m + g$	$m - g$	$1 - w$
Worker	$w - g$	g	w
	$1 - m$	m	1

For all four cells to be positive, the following condition is necessary in addition to $0 < g < m$ and $0 < g < w$.

$$1 - w - m + g > 0.$$

For work status of a wife and presence of a child to be negatively correlated, g must be smaller than the expected value of independence model.

$$g < w\, m.$$

If we coordinate the proportion of worker (w) to horizontal and that of mother (m) to vertical axis, the area enclosed by a straight line and a hyperbola simultaneously satisfies two conditions above. Figure 32 shows such areas for g = 0.2, 0.4 and 0.6. The higher the proportion of working mothers, the narrower the area and it moves upper-right direction. Then, the paradoxical situation of

negative correlation at micro level and positive correlation at macro level can be understood as a result of an increasing compatibility. When wife's work and childrearing was less compatible, all the countries were located at lower-left region of the graph. However, some countries succeeded in improving the compatibility and moved to upper-right direction. In this way, the positive correlation appeared at macro level while the negative correlation is sustained at micro level.

Table 4 shows contingency tables of wife's work status and presence of a child obtained from the Employment Status Survey by the Statistics Bureau. Although a slight improvement can be seen for wives aged between 25 and 29, the overall compatibility did not improve between 1992 and 2002. For married women in early 30s, the proportion of working mothers decreased from 36.7% in 1992 to 30.2% in 2002. In late 30s, the compatibility dropped from 53.6% to 46.7%. Thus, it can be said that the governmental effort since the 1990s failed in improving compatibility and in raising fertility.

Besides the labor market condition, the declining proportion of living with couple's parent is supposed to have contributed to the decline in proportion of working mothers. According to this survey, the proportion of mothers aged

between 25 and 39 who live with their own or husbands' parent dropped from 37.3% in 1992 to 17.7% in 2002. It is thought that the governmental effort to provide with childcare services could not resist these socio-economic changes.

Some analyses of micro data identified the effect of childcare service on work status of wife. For example, Oishi (2003) found that the cost of daycare service has negative impact on wife's labor force participation. However, recent studies could not identify a significant effect of childcare service on fertility. Shigeno and Ohkusa (1999) included such indices as waiting list for daycare service, availability of infant care and night-time care into their model but none of them had significant effect on recent birth. Shigeno and Matsuura (2003) included respondent's substantive evaluation for local childcare service into their fertility function but its t value was 1.19. Thus, even if there is a net effect of governmental effort on fertility, its magnitude is too small to be verified easily.

3-5. Local Governments and Private Companies

The Ministry of Health, Labour and Welfare has been supporting installation and management of community childrearing support centers by local governments. These centers are supposed to provide counseling, to arrange

information on childcare services including registered baby-sitters, and to support circles of parents with small children. In 2004, the Ministry started subsidizing cost of medical treatment for infecundity. A couple treated in-vitro fertilization or micro fertilization can receive 100,000 yen during two-year period. The cost is shared by the central and local government in fifty-fifty. The Ministry also proposed creation of "Emergency Support Network" for parents. In cases such as a sudden overtime work or a business travel, a registered member of the network takes care of the child instead of the parent.

The Next Generation Law demanded local governments and large companies to submit their own plans on bearing and rearing new generations by April, 2005. According to the Ministry of Health, 98.7% of local governments and 59.5% of large companies submitted plans by June, 2005. Medium and small companies with 300 or less employees are supposed to pay efforts to make and submit plans, though it is not compulsory. There were 811 such companies that submitted plans by June, 2005.

Many local governments, especially those suffering from population decline, have been offering one time cash benefit at birth. There are some towns and villages that offer also at marriage or entrance to a primary school. Another

type of cash benefit is an expanded child allowance. For example, Sinjuku ward in Tokyo metropolitan area plans to extend child allowance until the graduation from a junior high school. This is ten years longer than the national child allowance system.

Local governments are paying effort to promote childcare leave of fathers within their own offices. Sendai city in north-eastern Japan set a target to raise the rate from 1.4% in 2003 to 5% in 2009. Toyama prefecture introduced “childcare participation leave” of five days for male public servants. To assist employees of private companies, some local government started low or no interest loans for parents during childcare leave.

In addition to running childrearing support centers, local governments are trying to provide with various childcare services. Many local governments included numerical goals on expanding infant care, night-time care and holiday care into their programs to foster the next generation. While some cities and towns subsidize childcare costs, Bandai town in Fukushima prefecture made the public kindergarten free of charge. Most local governments organize or support circles of parents and volunteer childcare takers. The Ministry of Health attempts to spread more effective organizations by promoting the Emergency Support Network

mentioned above.

An innovative feature of the New-New Angel Plan announced in 2004 was the focus on economic independence of young people. This was a response to the increasing number of “freeters” (temporally workers) and “NEETs” (young people Not in Employment, Education or Training). Following these concerns, many local governments proposed such measures as installation of job information center, introduction of trial employment program, and support for farm successors.

A unique program of Ishikawa prefecture frequently shows up on newspapers. The “premium passport” given to families with three children or more allows the holder to shop with special discount and to receive special services. A pregnant woman is registered at a daycare center and can take lessons on maternity and childcare there. After the birth, she is eligible for counseling and three times free daycare services. In addition, Ishikawa prefecture started the “Emergency Support Network” proposed by the Ministry of Health.

To stimulate vigorous participation of private companies, the Next Generation Law contains a certification program. A company that showed a good performance in fostering the next generation is allowed to use a governmental

certification mark on its products, advertisements and commercial messages. To be certificated, a company needs to submit an appropriate program and achieve its own goals. In addition, 70% of female employees and at least one male employee must take childcare leave. The company is also required to shorten working hours or to increase the number of paid holidays actually used. Many medium and small companies have submitted their plans in order to get the certification, even though the submitting is not compulsory.

Some companies plan to introduce own child allowance or childcare leave. Large electronic makers such as Matsushita, Mitsubishi and NEC are reducing allowance for spouse and raising that for children. Saibu Gas Company in western Japan extended childcare leave to the third birthday of a child. On the other hand, there are only a small portion of companies that run own childcare room. According to the Statistics and Information Department of the Ministry of Health, there were 979 daycare rooms within office in 2003. Since there are approximately six million offices in Japan, the proportion is negligible.

Chapter 4. Low Fertility and Policy Intervention in Comparative Perspective

4-1. Spread of Lowest-Low Fertility in Europe and Asia

Lowest-low fertility appeared in Europe during the 1990s causing a drastic change in demographic map of the region. The second demographic transition theory (van de Kaa, 1987) described the novelty of Western and Northern European countries in terms of below replacement fertility and emergence of postmodern behaviors such as cohabitation and extramarital births. However, while these forerunners stayed at moderately low fertility, late comers showed unexpected decline to lowest-low fertility. This change caused not only the reverse in the geographic pattern of European fertility but also that in the correlation with fertility of the total first marriage rate, the proportion of extramarital births, and the female labor force participation rate (Kohler et al., 2002, pp. 643-644).

Table 5 lists up the countries having lowest-low fertility since 2000. While Kohler and his coauthors (2002) listed 14 countries in 1999, there are 21 countries in this new list. Korea arrived at the threshold of 1.3 in 2001, followed

by Japan and Taiwan in 2003. Metropolitan areas such as Hong Kong and Singapore are not included because they are difficult to compare with other nations with rural area. In Southern Europe, Bosnia-Herzegovina joined the group recently. It turned out that TFR of San Marino was already at lowest-low level in the mid 1990s. In Eastern Europe, Poland and Slovak are new comers. Lithuania and Moldova are newly enlisted former USSR member countries. On the other hand, Belarus was excluded because of the lack of recent data. Estonia escaped from the group with the recent upswing of TFR. Russia also came out of the threshold in 2002.

Although Taiwan is catching up quickly, Korea is still the top runner in Eastern Asia. When compared with Japan, fertility and nuptiality declines in Korea have been much more drastic (Suzuki, 2003a). Probably both structural conditions such as “compressed modernity” (Chang KS, 2001; 2002) and a specific event such as economic crisis (Eun KS, 2003) are responsible. Jun KH (2002) pointed out that overheated competition, arrival of mass consumption society, conflict between female labor force participation and childrearing, and extraordinary homogeneity of Korean society as the background of recent fertility decline. The most comprehensive and well organized list of determinants can be

found in Kim SK (2004).

In terms of the direct cost of children, Korea shows much more exaggerated pattern than Japan. Educational fever in Korea is so unusual that parents are almost aggressive about educational achievement of their children. College enrollment grew rapidly since the 1980s and the "educational inflation" has caused continuous oversupply of college graduates (Lee JY, 2002). According to the OECD statistics, Korea's expenditure on educational institutions accounted for 8.2% of GDP in 2001 and was highest among countries for which data were available. The heavy burden of human investment is strongly felt by Korean women. According to Chang HK (2004, p. 130), the most frequent answers to the causes of fertility decline (multiple choice) were "Educational cost is too high" (51.6%) and "Childrearing costs other than education are too high" (52.8%). In the 2003 national fertility survey, "childcare and (public) educational cost" and "private educational cost" were listed as the most serious difficulties in household expenditure (Kim SK, 2004, p. 16; Kim SK et al., 2004, p. 159).

While Japan suffered from the economic recession throughout the 1990s, an acute economic crisis hit Korea in 1997. Eun KS (2003) asserted that the reconstruction of labor market after the crisis made it difficult for the youths to

find jobs and raised the uncertainty of workers' future lives. This labor market change is thought to have caused the fertility decline mainly through the nuptiality decline. Lee SS and coauthors (2004, p. 86) also suggested the effect of economic crisis and uncertainty toward future on the recent low propensity to marry. However, the labor market condition can affect not only on nuptiality but also on marital fertility. The latter would include the increasing anxiety of couples on their future lives that discourages a plan to have a child, as shown for Japan in Figure 24.

The M-shaped curve of female labor participation pattern implies that there is a serious conflict between wife's work and childcare in Korea as in Japan. In Korea, there is a debate on if the recent change in M-shaped curve implies improvement in compatibility between work and child care (Park KS and Kim YH, 2003, p. 67). Considering the GEM score (0.479) that is even lower than Japan, there seems to remain the critical incompatibility in Korea.

4-2. Effectiveness of Pronatal Policy

Table 6 summarizes the estimated effects of current policy interventions on TFR in Japan. Child allowance is supposed to be raising TFR by 0.0167 at

maximum. The effect of tax relief is thought to be between 0.0143 and 0.0417. It is estimated that childcare leave can elevate TFR by between 0.0027 and 0.0277. If these effects were additive, TFR would decline by between 0.0226 and 0.0861 if these measures were abolished. Then, TFR in Japan would fall between 1.20 and 1.27 instead of 1.29 on today. Of course, this is a very rough estimate ignoring various heterogeneities and relying on oversimplified assumptions.

Table 7 shows a simulation of TFR increase when Japan adopted the child allowance system of France or Sweden. The increase in cash benefit differs by the number of children. Because it is difficult to obtain the parity distribution of married women in reproductive ages, the distribution by birth order in 2003 was used as an estimate of distribution by the number of children. The average increase in cash benefit by adopting French or Swedish system was multiplied with the coefficients of Oyama (2004) and Yamagami (1999) to estimate the change in TFR. Because family allowance is not provided to the first child in France, the average cash increase from the current Japanese system is only 2,115 yen. This would not cause a visible increase in TFR. The Swedish system is more generous and the cash benefit would rise by 14,137 yen. Even in this case, however, TFR would be improved by between 0.0141 and 0.0414. Thus, even if

Japan introduced the family allowance system of Sweden, its effect would be far from impressive.

Table 8 displays the effect of the proportion of infants' mothers taking childcare leave (p) on TFR. If we accept the coefficient by Suruga and Chang (2003), TFR recovery by 0.1 would be achieved by raising the proportion from 9.2% of today to approximately 43%. However, if the reality were closer to the coefficient by Suruga and Nishimoto (2002), such an improvement would be impossible. In any case, 20% would be ambitious enough as a proximate target. If this target were met, TFR would rise by 0.03 at maximum. After all, it would be very difficult to lift TFR by 0.1 with child allowance and childcare leave policies even though these effects were additive. Although quantitative estimates for other policy measures are not available, simulation results shown here are discouraging about the role of policy interventions on fertility recovery.

There are considerable evidences on the effectiveness of pronatal policy. Cases frequently referred to include France after the Second World War, German state of Saar under French rule, Eastern European socialist countries until the 1970s, and Sweden around 1990 (Chesnais, 1998, pp. 98-99; Atoh, 2000, pp. 198-199; Caldwell et al., 2002, p. 18). Besides these historical cases, abundant

quantitative analyses of micro data have proved the effectiveness of various policy measures (Kojima, 1989; 2003). Thus, it is widely accepted that pronatal policy has some effect. However, the critical question here should be “Can Japan achieve moderately low fertility of France or Sweden with policy interventions?”. According to the CIA World Factbook, TFR in France was 1.85 and that in Sweden was 1.66 in 2004. It seems to be very difficult to narrow the difference from Japan (1.29) considering the small elasticity of fertility to policy measures.

Even if policy intervention is successful, its effect is not necessarily durable. Figure 33 displays trajectory of TFR in Singapore. In March 1987, Singapore started a new population policy. Under the slogan of "Have three or more, if you can afford", such pronatal measures were enforced as tax relief for the third and higher order children, subsidization of daycare cost, and housing privilege for a large family (Sasai, 2005, pp. 466-467). As a result, TFR jumped from 1.43 in 1986 to 1.96 in 1988. However, TFR started declining again from 1989, though it took 15 years to drop to the level of 1986. Singapore government enforced additional measures such as child allowance, extension of childcare leave, and promotion of family-friendly enterprises in August, 2000. This time, however, the intervention was not as successful as in 1987.

There is diversity in attitudes among Korean demographers toward the effectiveness of pronatal policies. Park ST (2002, p. 653) suggested that educational policy that gives an advantage to a large family would be effective in addition to measures already applied in Japan. Kim SK (2004, p. 31) expressed an optimistic view that an efficient development of governmental policy can raise Korean TFR to 1.6 within a decade. Jun KH (2005) also emphasized the effectiveness of pronatal policy, referring to experiences of France in the 1950s and of Eastern Germany in the 1970s. On the other hand, Kim DS (2005) gave a pessimistic prediction that pronatal policy will not work considering rapid population aging and negative attitude toward marriage and childbearing among young Korean women. The Dong-A Ilbo (2005/7/8) wrote in its special issue on low fertility in Korea that "nobody believes that fertility can recover solely with pronatal policy". This paper also stands in the pessimistic side.

4-3. Cultural Deterministic View on Fertility

France is famous for its long history of pronatal policy intervention. The Family Code that imposed family allowances was enacted as early as in 1939 and was integrated to social security system in 1945 (Kojima, 1996, p. 157; Caldwell

et al., 2002, p. 8). In the background, there was an anxiety on French fertility that was lower than England throughout the 19th century (Chesnais, 1998, p. 92). On the contrary to France, the United Kingdom is famous as a country without pronatal policy (Hiraoka, 1996, p. 131; Atoh, 2000, p. 200; Kamano, 2003, p. 54). Parental leave is 26 weeks and no cash benefit is given (Fukuda, 2003, p. 12), which is less generous than Japan. Governmental effort for childcare service is low and non-profit organizations play a major role. Child allowance is lower for the second and higher order children (Neyer, 2002, pp. 62-67). In spite of this opposing policy orientation, TFRs in France and the United Kingdom showed a very similar trajectory. As depicted in Figure 34, it is only since 1998 that France has consistently overcome the United Kingdom in fertility.

Weak explanatory power of policy intervention becomes clearer if we include another English speaking country. The United States is even more indifferent to family policy than the United Kingdom. There is no child allowance system. Parental leave is untouched to be 12 weeks without cash benefit (Kamano, p. 55). Despite the lack of governmental effort, TFR of the United States has been considerably higher than France since the mid 1980s. Thus, there must be some socio-cultural characteristics in Anglo-Saxon countries that keep fertility higher

than France. The distinctive feature of age pattern of fertility in English-speaking countries (Chandola et al., 2002) seems to support such an inference.

More importantly, there is a cultural divide between moderately low fertility and lowest-low or very low fertility. As suggested in Table 8, all the Western and Northern European countries and English-speaking countries have successfully avoided lowest-low fertility. McDonald (2005) chose the line of 1.5 to divide moderately low fertility and very low fertility. In his cultural divide, all the Nordic countries, all the English-speaking countries, and all the French and Dutch speaking Western European countries have TFR of 1.5 or higher. Countries with very low fertility are all the advanced Eastern European countries, all the Southern European countries and all the German-speaking Western European countries. While emphasizing the role of policy intervention, McDonald suggested that this divide has a deep historical root and is difficult to change. Atoh (2005, pp. 51-52) pointed out the influence of traditional value as one of factors beyond the family policy.

When lowest-low fertility was a phenomenon within Europe, it was natural to look for features common in lowest-low fertility countries. However, once lowest-low fertility has spread out from Europe, the appropriateness of this

attempt is questionable. Because lowest-low fertility has appeared in very different cultural settings in Southern Europe, Eastern Europe and Eastern Asia, the phenomenon seems to be a natural response to socioeconomic changes in the postmaterial era. In this perspective, those countries that have avoided lowest-low fertility should be seen as exceptional and requiring explanation. This section expands the discussion in Suzuki (2003a) and examines cultural determinants of moderately low fertility in Western and Northern Europe and advanced English-speaking countries.

Reher (1998) asserted that the contrast between weak family ties in Western and Northern Europe and strong family ties in Southern Europe has a deep historical root. In contrast to the Oriental family system that affected Southern Europe, the "Occidental" structure was based on the conjugal pair and women's position was high in northern part of the continent. The Reformation changed the meaning of marriage from a sacrament to a civil contract, enhanced women's position further, lowered parental authority, and promoted individualism (Reher, 1998, pp. 213-214). Thus, gender equity and compatibility between wife's work and childcare in today's moderately low fertility countries have long historical background. This is why these countries developed non-parental

childcare activities by baby sitters, tutors, childcare workers and other professionals. To the contrary, countries with strong family ties are still clinging to maternal cares. According to the Second National Family Survey in 1998 (NIPSSR), 90% of Japanese wives agreed to "A mother should not work but take care of her child for three years after the birth".

Another prominent feature of Western-Northern Europe and its descendents is early home-leaving. In these countries in pre-industrial era, young men and women left the parental home before marriage to work as servants (Reher, 1998; Wall, 1999). The tradition that the majority of men and women leave home before marriage still remains today (Billari et al., 2001, pp. 18-19). Premarital home-leaving is supposed to promote union formation through both consensual union and formal marriage, while Southern European adolescents are suffering from postponement syndrome that discourages autonomy and decision making ability on their own lives (Dalla Zuanna, 2000; Livi-Bacci, 2001). As shown in Figure 35, Japan occupies a singular position that men leave as early as Northern Europeans while women leave as late as Southern Europeans. However, since late leaving of either sex discourages union formation, Japan is thought to be closer to Southern Europeans.

Last but not least, a clear cultural divide in cohabitation and extramarital births has been observed. These postmodern behaviors were once related to the fertility decline to below replacement level. Today, however, the low frequency of such behaviors is a good predictor of lowest-low fertility. Japan is characterized by very robust marriage institution. As shown in Figure 36, the proportion of extramarital births in Japan has been extremely low even compared with lowest-low fertility countries in Southern Europe. The proportion in 2003 was 1.93%, which hardly changed from 0.80% in 1980. As long as the Japanese people cling to reproduction via marriage, it would be difficult to avoid postponement syndrome, to cease overprotecting children, to flatten continuously rising cost of children, and to socialize childrearing.

Patterns of home-leaving, cohabitation and extramarital births are unclear in Korea. It seems that no Korean demographer is interested in home-leaving behavior of young people. Some Korean demographers asserted that premarital cohabitation is recently on an increase without showing any evidence (Jun KH, 2002, p. 110; Byun HS, 2002, pp. 244-245). However, the Frontiers of Gender Studies Survey in 2004 by Ochanomizu University showed that, in Seoul capital region, the proportion of unmarried persons who experienced cohabitation was as

low as in Japan (Takezawa, 2005, p. 50). Thus, the proportion of currently cohabiting young women is supposed to be practically zero[3]. No data are available for extramarital births, even though it is widely believed that such cases are rare in Korea (Cho BY et al., 1999, p. 31; Eun KS, 2003, p. 577; Lee SS et al., 2004, p. 74).

[3] The proportion for Japan is estimated to have been 0.48% in the late 1990s (Suzuki, 2003a, p. 6).

Conclusion

Japan has been adopting and extending policy measures to cope with low fertility. However, those efforts have not been successful in preventing fertility decline. Quantitative analyses have shown that the effects of policy interventions are weak. Thus, a large part of the difference from moderately low fertility should be attributed to direct effects of cultural features, not to governmental efforts. It is just a fantasy that TFR would come back to moderately low level if Japan adopted policy interventions used in Western and Northern Europe. Although gender equity is a widely accepted political goal, it would be difficult to catch up Western-Northern Europe that has long historical background. It is questionable if a consensus can be made that a government should promote early home-leaving of young people. A government definitely should not induce extramarital births by increasing the number of welfare mothers. Then, continuous fertility recovery would be impossible without a radical change in family pattern. Although there is a sign of assimilation to Western-Northern weak family pattern in Southern Europe as shown in Figure 35, such a change would be more difficult to take place in Eastern Asia. Then, it would be possible that lowest-low fertility in Eastern Asia lasts longer and falls further than that of European forerunners.

References

(in English)

Becker, Gary S. (1991) "Demand for Children," in *A Treatise on the Family, Enlarged Edition*, Harvard University Press, Cambridge, Massachusetts, pp. 135-154.

Billari, Francesco C. and Hans-Peter Kohler (2002) "Patterns of Lowest-Low Fertility in Europe," Max Planck Institute for Demographic Research Working Paper WP-2002-040.

Billari, Francesco, Dimiter Philipov and Pau Baizán (2001), "Leaving Home in Europe: The Experience of Cohorts Born around 1960," Max Planck Institute for Demographic Research Working Paper WP 2001-014.

Bongaarts, John (1978) "A Framework for Analyzing the Proximate Determinants of Fertility," *Population and Development Review*, Vol. 4, No. 1, pp. 105-132.

Bongaarts, John and Griffith Feeney (1998) "On the Quantum and Tempo of Fertility," *Population and Development Review*, Vol. 24, No. 2, pp. 271-291.

Caldwell, John C., Pat Caldwell and Peter McDonald (2002) "Policy Responses to Low Fertility and Its Consequences: A Global Survey," *Journal of Population Research*, Vol. 19, No. 1, pp. 1-24.

Chandola, T., D. A. Coleman and R. W. Hiorns (2002) "Distinctive Features of Age-Specific Fertility Profiles in the English-Speaking World: Common Patterns in Australia, Canada, New Zealand and the United States, 1970-98," *Population Studies*, Vol. 56, pp. 181-200.

Chesnais, Jean-Claude (1998) "Below-Replacement Fertility in the European Union (EU-15): Facts and Policies, 1960-1997," *Review of Population and Social Policy*, No. 7, pp. 83-101.

Easterlin, Richard A. (1978) "What Will 1984 Be Like? Socioeconomic

Implications of Recent Twists in Age Structure," *Demography*, Vol. 15, No. 4, pp. 397-421.

Engelhardt, Henriette and Alexia Prskawetz (2005) "A Pooled Time-Series Analysis on the Relation Between Fertility and Female Employment," IUSSP XXV International Population Conference, Tours, 2005.

Eun, Ki-Soo (2003), "Understanding Recent Fertility Decline in Korea," *Journal of Population and Social Security*, Supplement to Volume 1, http://www.ipss.go.jp/ English/WebJournal.files/Population/2003_6/20.Eun.pdf

Feeney, Griffith (1986) "Period Parity Progression Measures of Fertility in Japan," NUPRI Research Paper Series No. 35.

Frejka, Tomas and Gérald Calot (2001) "Cohort Reproductive Patterns in Low-Fertility Countries," *Population and Development Review,* Vol. 27, No. 1, pp. 103-132

Gauthier, Anne H. (2002) "Family Policies in Industrialized Countries: Is There Convergence?" *Population English Edition*, Vol. 57, No. 3, pp. 447-474.

Inaba, H. (1996) "Human Population Reproduction via First Marriage," *Mathematical Population Studies*, 5, pp. 123-144.

Jun, Kwang-Hee (2005) "The Transition to Sub-Replacement Fertility in South Korea: Implications and Prospects for Population Policy," *The Japanese Journal of Population*, Vol. 3, No. 1, pp. 26-57. http://www.ipss.go.jp/webj-ad/WebJournal.files/population/2005_6/jun.pdf

Kim, Doo-Sub (2005) "Theoretical Explanations of Rapid Fertility Decline in Korea," *The Japanese Journal of Population*, Vol. 3, No. 1, pp. 2-25. http://www.ipss.go.jp/webj-ad/WebJournal.files/population/2005_6/kim.pdf

Kim, Young J. and Robert Schoen (2000) "On the Quantum and Tempo of Fertility: Limits to the Bongaarts-Feeney Adjustment," *Population and Development Review*, Vol. 26, No. 3, pp. 554-560.

Kohler, Hans-Peter, Francesco C. Billari and José Antonio Ortega (2002) “The Emergence of Lowest-Low Fertility in Europe during the 1990s,” *Population and Development Review,* Vol. 28, No. 4, pp. 641-681.

Kohler, Hans-Peter and Dimiter Philipov (2001) “Variance Effects in the Bongaarts-Feeney Formula,” *Demography*, Vol. 38, No. 1, pp. 1-16.

Mason, Andrew (2001) “Population and Economic Growth in East Asia,” in Mason, Andrew (ed.), *Population Changes and Economic Development in East Asia*, Stanford University Press, pp. 1-30.

McDonald, Peter (2005) “Fertility and the State: The Efficacy of Policy,” XXV International Population Conference.

Neyer, Gerda, (2003) "Family Policies and Low Fertility in Western Europe", *Journal of Population and Social Security: Population Study*, Supplement to Vol. 1, pp. 46-93.
http://www.ipss.go.jp/webj-ad/WebJournal.files/population/2003_6/3.Neyer.pdf

Ortega, José Antonio and Hans-Peter Kohler (2002) “Measuring Low Fertility: Rethinking Demographic Methods,” Max Planck Institute for Demographic Research Working Paper 2002-001.
(http://www.demogr.mpg.de/papers/working/wp-2002-001.pdf)

Park, Chai Bin and Cho Nam-Hoon (1995) “Concsequences of Son Preference in an Low-Fertility Society; Imbalance of the Sex Ratio at Birth in Korea,” *Population and Development Review,* Vol. 21, No. 1, pp. 59-84.

Poston, Dudley L., Jr. and Karen S. Glover (2005) “Too Many Males: Marriage Market Implications of Gender Imbalances in China,” XXV International Population Conference.

Rallu, J. L. and L. Toulemon (1993) “Les mesurés de la fecondité transversale: I. Construction de différents indices,” *Population* Vol. 48, No. 1, pp. 7-26. [English translation in *Population, English Selection*, 1994]

Reher, David Sven (1998), "Family Ties in Western Europe: Persistent Contrasts," *Population and Development Review,* Vol. 24, No. 2, pp. 203-234.

Suzuki, Toru (2003a) "Lowest-Low Fertility in Korea and Japan," *Journal of Population Problems*, Vol. 59, No. 3, pp. 1-16.

Suzuki, Toru (2004) "Why Do Age-Specific Marital Fertility Rates Fail?" National Institute of Population and Social Security Research, Working Paper Series (E) No. 20.

Suzuki, Toru (2005) "Why is Fertility in Korea Lower than in Japan?" *Journal of Population Problems*, Vol. 61, No, 4 (forthcoming).

Tsuya, Noriko O. and Larry L. Bumpass (2004) "Gender and Housework," in Noriko O. Tsuya and Larry L. Bumpass (eds.), *Marriage, Work and Family Life in Comparative Perspective*, University of Hawaii Press, pp. 114-133.

Tsuya, Noriko O. and Karen Oppenheim Mason (1995), "Changing Gender Roles and Below-replacement Fertility in Japan," in Karen Oppenheim Mason and AnMagritt Jensen (eds.), *Gender and Family Change in Industrial Countries*, Oxford, Clarendon Press, pp. 139-167.

United Nations (1956) *The Aging of Population and Its Economic and Social Implications*, Population Studies No. 26.

van de Kaa, Dirk (1987), "Europe's Second Demographic Transition," *Population Bulletin* Vol. 42, No. 1.

van Imhoff, Evert (2001) "On the Impossibility of Inferring Cohort Fertility Measures from Period Fertility Measures," *Demographic Research,* Vol. 5, No. 2, pp. 24-64.
(http://www.demographic-research.org/Volumes/Vol5/2/)

van Imhoff, Evert and Nico Keilman (2000) "On the Quantum and Tempo of Fertility: Comment," *Population and Development Review*, Vol. 26, No. 3, pp.

549-553.

Wall, Richard (1999), "Leaving Home and Living Alone: A Historical Perspective," *Population Studies,* Vol. 43, No. 3, pp. 369-389.

Willis, Robert J., “Economic Analysis of Fertility: Micro Foundations and Aggregate Implications,” in Kerstin Lindahl Kiessling and Hans Landberg (eds.) *Population, Economic Development and the Environment – The Making of Our Common Future,* Oxford University Press, pp. 139-171.

Zeng, Yi and Kenneth C. Land (2001) "A Sensitivity Analysis of the Bongaarts-Feeney Method for Adjusting Bias in Observed Period Total Fertility Rates," *Demography*, Vol. 38, No. 1, pp. 17-28.

(in Japanese)

 見泰司 石坂公一 大江守之 小山泰代 川祥子 松本 澄 (Asami et al., 2000) 「少子化現象と住宅事情」『人口問題 究』第56 第1 , pp. 8-37.

阿藤誠 (Atoh, 1992)「日本における出生率の動向と要因」河野稠果 岡田實(編)『低出生力をめぐる諸問題』大明堂, pp. 48-68.

阿藤誠 (1997) 「日本の超少産化減少と 値 動仮 」『人口問題 究』第53 第1 , pp. 3-20.

阿藤誠 (Atoh, 2000) 代人口 ［少子高 社 の基礎知識］』日本評論社.

阿藤誠 赤地麻由子 (Atoh and Akachi, 2003)
日本の少子化と家族政策：国際比較の視点から」『人口問題 究』第59 第1 , pp. 27-48.

石川晃 (Ishikawa, 2004) 「全 人口の再生産に する主要指標：2003年」『人口問題 究』第60 第3 , pp. 59-68.

岩澤美帆 (Iwasawa, 2002)「近年のTFR 動における結婚行動および夫婦の出生行動の 化の寄 について」『人口問題 究』第58 第3 , pp. 15-44.

大井方子 (Oi, 2004) 「バブル崩 前後の出産 子育ての世代間差異」樋口美雄 太田 家計 究所編『女性達の平成不況：デフレで き方 暮らしはどう わったか』日本 新聞社, pp. 117-151.

大石 希子 (Oishi, 2003) 「母親の就業に及ぼす保育費用の影響」『季刊社 保障 究』第39 第1 , pp. 55-69.

大塩まゆみ (Oshio, 1999) 「 童手 の 際比較」『海外社 保障 究』第127 , pp. 38-48.

大淵 森岡仁 (Obuchi and Morioka, 1981) 『 人口 』新評論.

大山昌子 (Oyama, 2004) 「子どもの養育 育費用と出生率低下」『人口 究』第35 , pp. 45-57.

勝又幸子 (Katsumata, 2003) 「 際比較からみた日本の家族政策支出」『季刊社 保障 究』第39 第1 , pp. 19-27.

金子隆一 (Kaneko, 2004)「出生 動の人口 的メカニズム」大淵 高橋重 編『少子化の人口 』原書房, pp. 15-36.

釜野さおり (Kamano, 2003) 「英語 諸 の出生率と家族政策－女性たちの と認識についての質的分析－」『人口問題 究』第59 第2 , pp. 51-68.

河野果稠 (Kono, 1995)「配偶 係と出生力」日本統計協 『現代日本の人口問題』大 省印刷局, pp. 63-110.

河野稠果 (Kono, 2000) 『世界の人口：第 2 版』東京大 出版 .

立社 保障 人口問題 究所 (NIPSSR, 1997),『日本の 推計人口：平成9年1月推計』 究資料第291 .

立社 保障 人口問題 究所 (NIPSSR, 2002) 『日本の 推計人口：平成14年1月推計』 究資料第303 .

立社 保障 人口問題 究所 (NIPSSR, 2003) 『平成14年第12回出生動向基本調査第 I 報告書：わが 夫婦の結婚過程と出生力』調査報告資料第18 .

 立社 保障 人口問題 究所 (NIPSSR, 2005) 『社 保障統計年報：平成16年版』社 保障 究資料第4 .

小島宏 (Kojima, 1989) 「出生促進政策の有 性」『人口問題 究』第45 第2 , pp. 15-34.

小島宏 (Kojima, 1996) 「フランスの出生 家族政策とその 果」阿藤誠偏『先進諸 の人口問題－少子化と家族政策』東京大 出版 , pp. 157-193.

小島宏 (Kojima, 2003) 「フランス語 における出生動向と家族政策」『人口問題 究』第59 第2 , pp. 1-19.

佐 井司 (Sasai, 1998) 「近年の夫婦出生力 動とその規定要因」『人口問題 究』第54 第4 , pp. 3-18.

佐 井司 (Sasai, 2005) 「シンガポ ルと香港における少子化のメカニズムと少子化 策」小島宏編『韓 台 シンガポ ル等における少子化と少子化 策に する比較 究』厚生 科 究費補助金政策科 推進 究事業 平成16年度 括 究報告書, 2005年3月, pp. 455-476.

滋野由紀子 松浦克己 (Shigeno and Matsuura, 2003) 「出産 育 と就業の 立を目指して－結婚 就業選 と 婚 就業女性に する育 休業制度の 果を中心に－」『季刊社 保障 究』第39 第1 , pp. 43-54.

七條達弘 西本 弓 (Shichijo and Nishimoto, 2003) 「若い世代の夫婦の子供 に影響を及ぼす要因」『理論と方法』第18 第2 , pp. 229-236.

人口問題審議 厚生省大臣官房政策課 厚生省人口問題 究所 (Population Problems Research Council et al., 1988) 『日本の人口 日本の家族』東洋 新報社.

鈴木透 (Suzuki, 2003b) 「離家の動向 性差 決定因」『人口問題 究』第59 第4 , pp. 1-18.

駿河輝和□ 張建華 (Suruga and Chang, 2003) 「育□ 休業制度が女性の出産と□ □ 就業に□ える影響について：パネルデ□ タによる計量分析」『季刊家計□ □ □ 究』第59□ , pp. 56-63.

駿河輝和□ 西本□ 弓 (Suruga and Nishimoto, 2002)
「育□ 支援策が出生行動に□ える影響」『季刊社□ 保障□ 究』第37□ 第4□ , pp. 371-379.

仙波由加里 (Semba, 2002) 「不妊と生殖補助技術の現□ と課題」『人口□ □ 究』第31□ , pp. 37-46.

高山憲之□ 小川浩□ 吉田浩□ 有田富美子□ 金子能宏□ 小島克久 (Takayama et al., 2000) 「結婚□ 育□ の□ □ コストと出生力－少子化の□ □ □ 的要因に□ する一考察－」『人口問題□ 究』第56□ 第4□ , pp. 1-18.

竹□ 純子 (Takezawa, 2005)
「結婚と交際」お茶の水女子大□ 『家族□ 仕事□ 家計に□ する□ 際□ 究－韓□ パネル調査第1年度報告書』F-GENS Publication Series 5, pp. 49-55.

津谷典子 (Tsuya, 1999) 「出生率低下と子育て支援政策」『季刊社□ 保障□ 究』第34□ 第4□ , pp. 348-360.

津谷典子 (Tsuya, 2003) 「北□ 諸□ の出生率低下と家族政策」『人口問題□ 究』第59□ 第1□ , pp. 49-80.

永□ 伸子 (Nagase, 2002) 「若年層の雇用の非正規化と結婚行動」『人口問題□ 究』第58□ 第2□ , pp. 22-35.

林謙治 (Hayashi, 2002) 「ジェンダ□ 問題としての出生性比－アジア諸□ からの考察－」阿藤誠□ 早□ 保子編『ジェンダ□ と人口問題』大明堂, pp. 21-42.

平岡幸一 (Hiraoka, 1996) 「イギリスの人口□ 出生動向と家族政策」阿藤誠偏『先進諸□ の人口問題－少子化と家族政策』東京大□ 出版□ , pp. 121-156.

廣嶋□ 志 (Hirosima, 1999) 「結婚と出生の社□ 人口□ 」, 目□ 依子□ 渡□ 秀樹編

『講座社□ □ 2 家族』東京大□ 出版□ 、21-57頁.

廣嶋□ 志 (Hirosima, 2000) 「近年の合計出生率低下の要因分解：夫婦出生率は寄□ していないか」『人口□ □ 究』第26□ , pp. 1-20.

廣嶋□ 志 (Hirosima, 2001)「出生率低下をどのようにとらえるか ―年□ 別有配偶出生率の問題性―」『理論と方法』第16□ 第2□ , pp. 163-183.

福田亘孝 (Fukuda, 2003) 「子育て支援政策の□ 際比較：日本とヨ□ ロッパ」『人口問題□ 究』第59□ 第1□ , pp. 7-26.

福田亘孝 (Fukuda, 2004) 「出生行動の特□ と決定要因－□ □ □ ジェンダ□ □ □ 値意識－」渡□ 秀樹□ □ 葉昭英□ 嶋崎□ 子編『現代家族の構造と□ 容：全□ 家族調査[NFRJ98]による計量分析』東京大□ 出版□ , pp. 77-97.

藤野敦子 (Fujino, 2002) 「家計における出生行動と妻の就業行動－夫の家事育□ □ 加と妻の□ 値□ の影響－」『人口□ □ 究』第31□ , pp. 19-35.

古郡□ 子 (Furugori, 2003) 「日本、韓□ 、ニュ□ ジ□ ランドにみる女性□ □ と育□ 問題」『季刊家計□ □ □ 究』第59□ , pp. 47-55.

目□ 依子□ 西岡八□ (Meguro and Nishioka, 2000)
「『少子化』問題のジェンダ□ 分析」『人口問題□ 究』第56□ 第4□ , pp. 38-69.

八代□ 宏 (Yashiro, 2000) 「少子化問題への□ □ □ 的アプロ□ チ」『季刊家計□ □ □ 究』第47□ , pp. 20-27.

山上俊彦 (Yamagami, 1999) 「出産□ 育□ と女子就業との□ 立可能性について」『季刊社□ 保障□ 究』第35□ 第1□ , pp. 52-64.

山口一男 (Yamaguchi, 2005) 「少子化の決定要因について：夫の役割、職場の役割、政府の役割、社□ の役割」『季刊家計□ □ □ 究』第66□ , pp. 57-67.

山田昌弘 (Yamada, 1999) 『パラサイト□ シングルの時代』ちくま新書.

(in Korean)

김승권 (Kim SK, 2004) “최근 한국사회의 출산율 변화원인과 향후 전망”『한국인구학』제27권제2호, pp. 1-33.

김승권, 조애저, 김유경, 박세경, 이건우 (Kim SK et al., 2004) 『2003년 전국 출산력 및 가족보건 · 복지실태조사』한국보건사회연구원 연구보고서 2004-23.

박경속, 김영혜 (Park KS and Kim YH, 2003) "한국 여성의 생애 유형: 저출산과 M자형 취업곡선에의 함의"『한국인구학』제26관제2호, pp. 63-90.

박상태 (Park ST, 2002) "인구정책" 김두섭 · 박상태 · 은기수 편『한국의 인구』통계청, pp. 645-673.

변화순 (Byun HS, 2002), “혼인상태”, 김두섭 · 박상태 · 은기수 편 『한국의 인구』통계청, pp. 219-245.

徐文姬 (Seo MH, 2004) “최근 보육 제도 및 정책의 변화와 과제”『보건복지포럼』97호, pp. 5-21.

이삼식, 변용찬, 김동회, 김형석 (Lee SS et al., 2004)『인구고령화의 전개와 인구대책』경제사회연구회 연구기관 고령화대비 협동 연구시리즈 04-02, 한국보건사회연구원.

이장영 (Lee JY, 2002) “교육수준” 김두섭 · 박상태 · 은기수 편『한국의 인구』통계청, pp. 283-313.

장경섭 (Chang KS, 2002), “한국 가족의 ‘정상 위기’: 이념적 다원성과 기능적 과부하를 중심으로”『한국의 예절』제4집, pp. 11-35.

장혜경 (Chang HK, 2004) 『저출산 원인 및 정책 욕구 관련 여성 대상 설문조사 결과』2004년11월26일, 국회보고자료.

전광희 (Jun KH, 2002), “출산력” 김두섭 · 박상태 · 은기수 편『한국의 인구』통계청, pp. 81-113.

조병엽 · 박병전 · 이화영 (Cho BY et al., 1999), “韓國의 제2차 人口變遷의 가능성” 朝鮮大學校統計研究所 『統計研究所論文誌』第1卷第1號, pp. 27-41.

崔恩鈴 (Choi EY, 2004) "한국보육정책의 공공성 평가 - 공급과 재정부담을 중심으로"『보건복지포럼』97호, pp. 22-30.

(internet resources)

CIA, The World Factbook
http://www.odci.gov/cia/publications/factbook/index.html

Council of Europe, Recent Demographic Development in Europe
http://www.coe.int/t/e/social_cohesion/population/demographic_year_book/

□閣府□合□□□究所 (Economic and Social Research Institute, 2005) 『フランスとドイツの家庭生活調査－フランスの出生率はなぜ高いのか－』□究□等報告書 No. 12. http://www.esri.go.jp/jp/archive/hou/hou020/hou012.html

厚生□□省 (Ministry of Health, Labour and Welfare) http://www.mhlw.go.jp/index.html

□□産業省 (Ministry of Economy, Trade and Industry, 2005) 『平成17年版□通商白書』http://www.meti.go.jp/report/tsuhaku2005/index.html

통계청 (Korea National Statistics Office) http://www.nso.go.kr/newnso/main.html

第2回全□家庭動向調査 (NIPSSR, The Second National Survey on Family in Japan, 1998) http://www.ipss.go.jp/ps-katei/j/Nsfj2/NSFJ2_index.html

人口統計資料集2005年版 (NIPSSR, Latest Demographic Statistics 2005)
http://www.ipss.go.jp/syoushika/tohkei/Popular/Popular2005.asp?chap=0

OECD, Education and Training,
http://www.oecd.org/topicstatsportal/0,2647,en_2825_495609_1_1_1_1_1,00.html

□政統計資訊服務網 (Taiwan Department of Statistics) http://www.moi.gov.tw/stat/

行政院主計處 (Taiwan Directorate-General of Budget, Accounting and Statistics)
http://www.dgbas.gov.tw/mp.asp?mp=1

United Nations Development Programme, Human Development Reports
http://hdr.undp.org/reports/global/2005/

APPENDIX

Figure 1. Total Population of Japan: 1945-2050

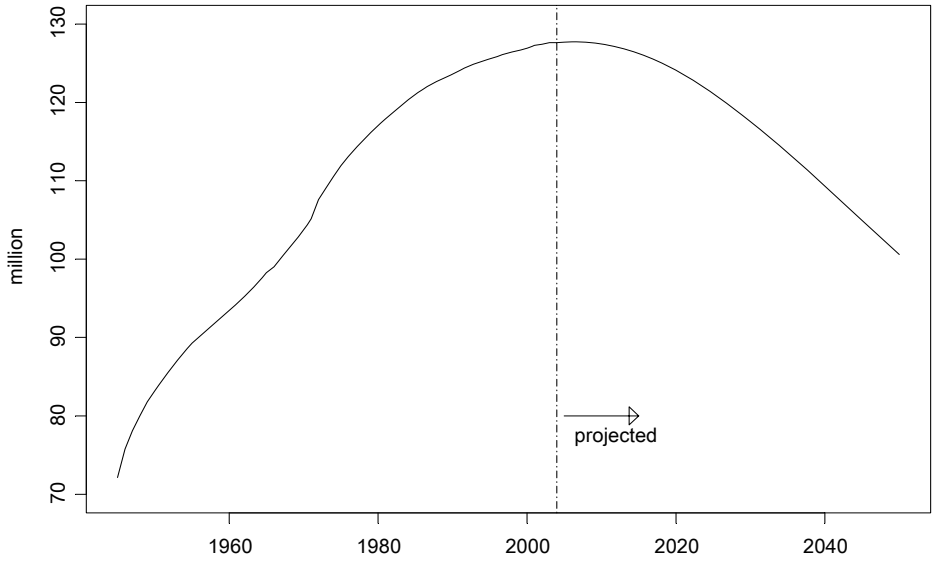


Figure 2. Population Growth Rate: 1947-2049

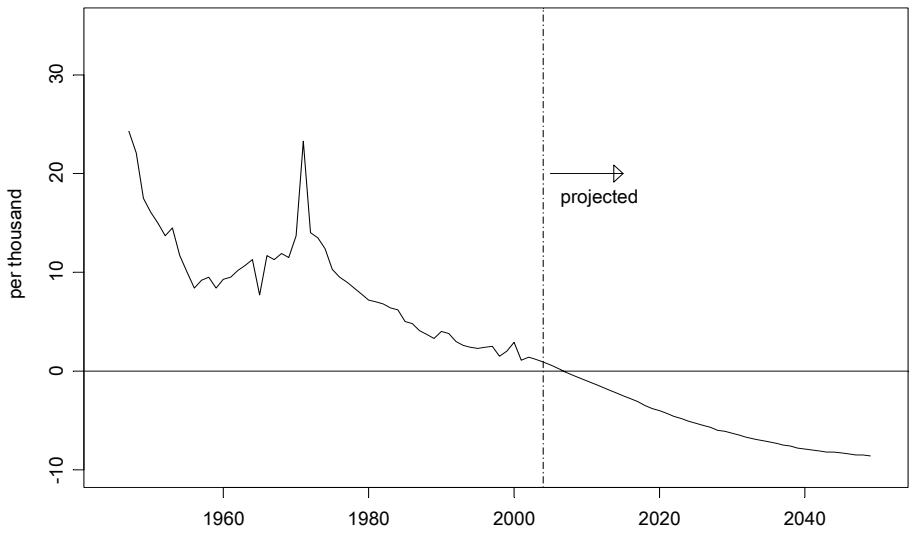


Figure 3. Natural Growth and Net Immigration: 1947-2049

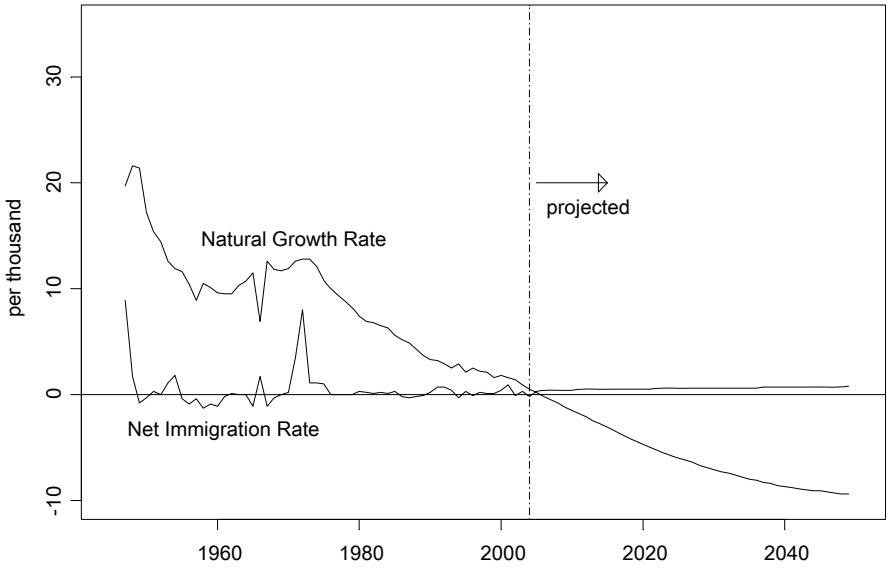


Figure 4. Crude Birth and Death Rates: 1947-2049

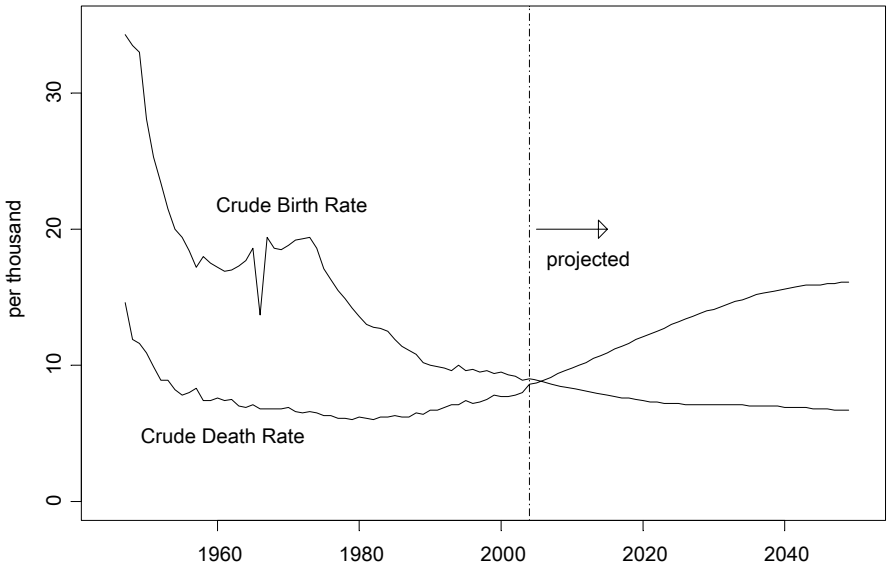


Figure 5. Total Fertility Rate: 1947-2050

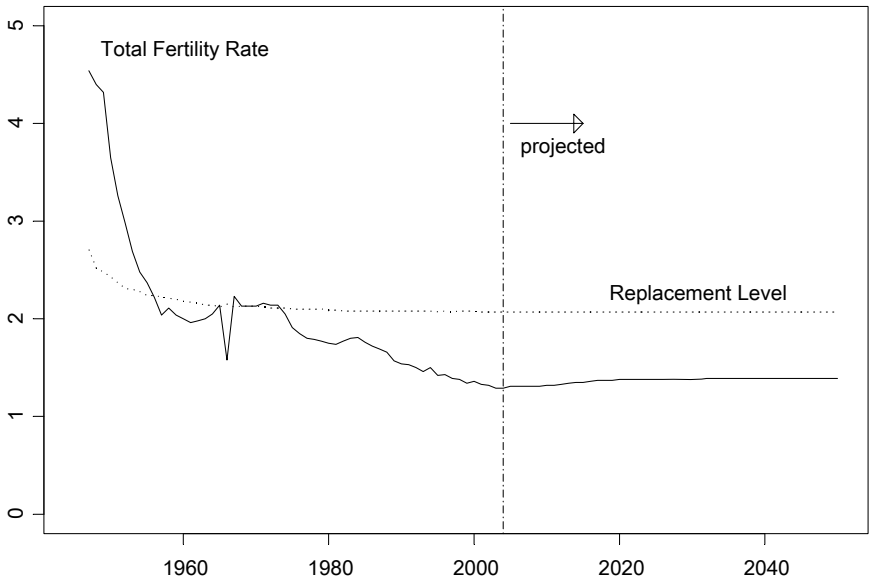


Figure 6. Life Expectancy at Birth: 1947-2050

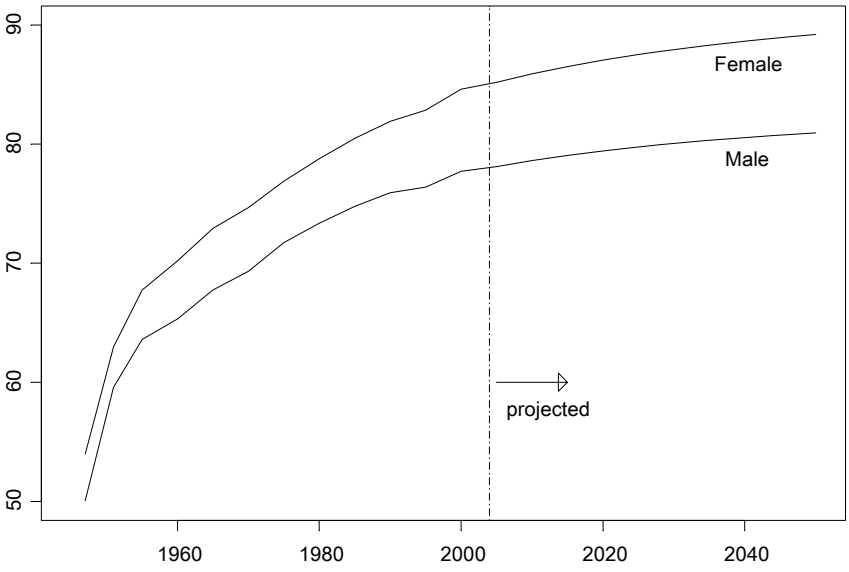


Figure 7. Sex Ratios: 1947-2050

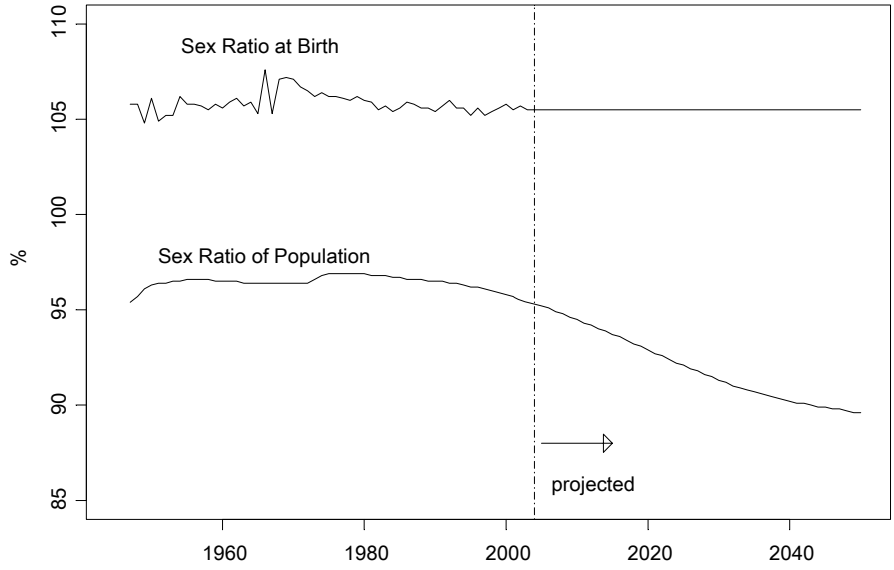


Figure 8. Proportion of 65 Years and Older: 1947-2050

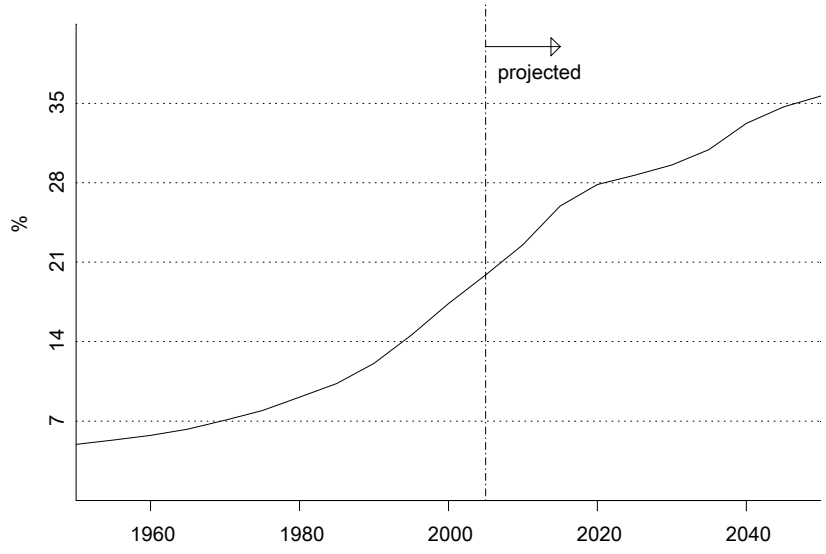


Figure 9. Dependency Ratios: 1950-2050

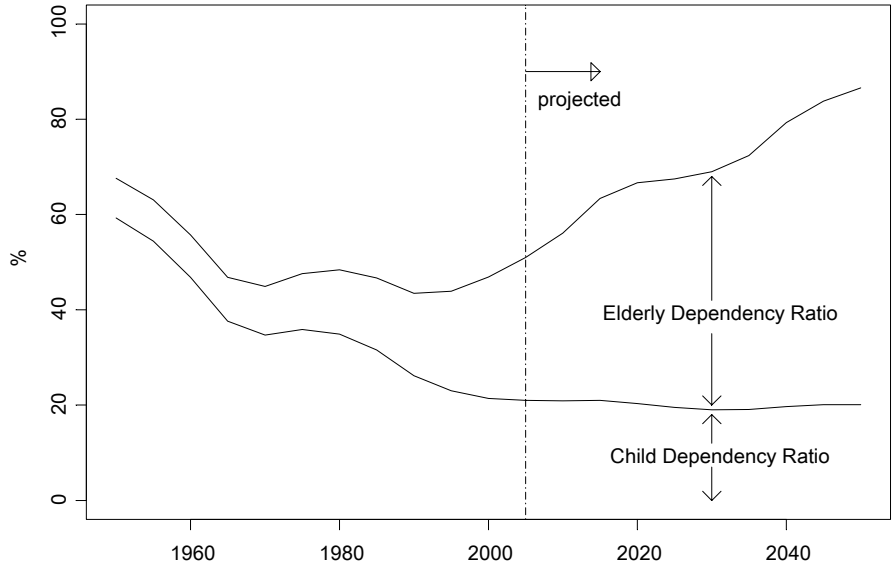


Figure 10. Elderly Population: 1950-2050

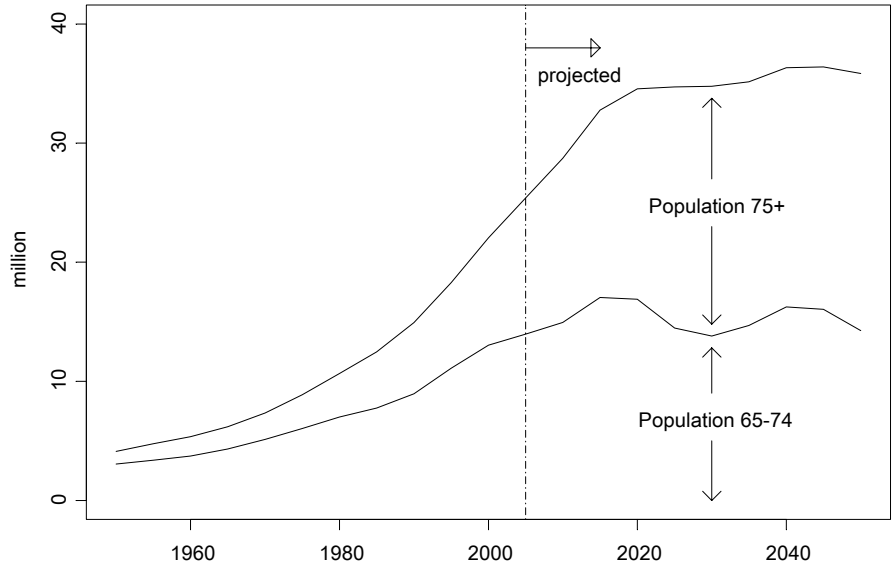


Figure 11. Working Age Population: 1950-2050

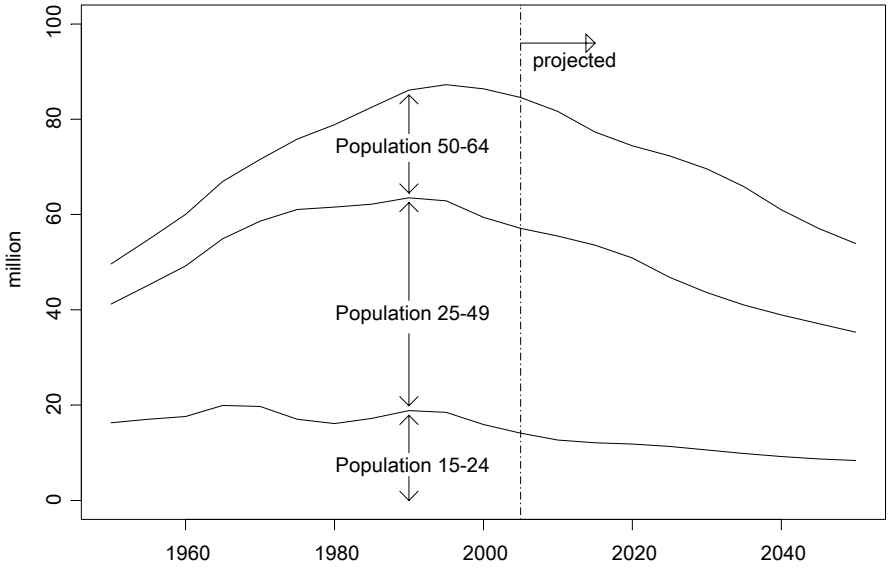


Figure 12. Cohort Cumulative Fertility Relative to 1950 Cohort

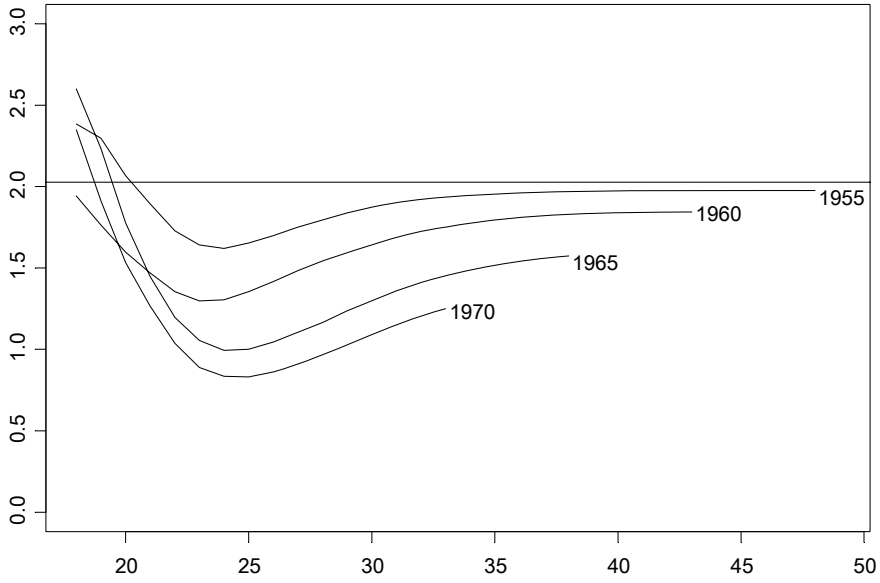


Figure 13. Mean Age at Birth by Birth Order

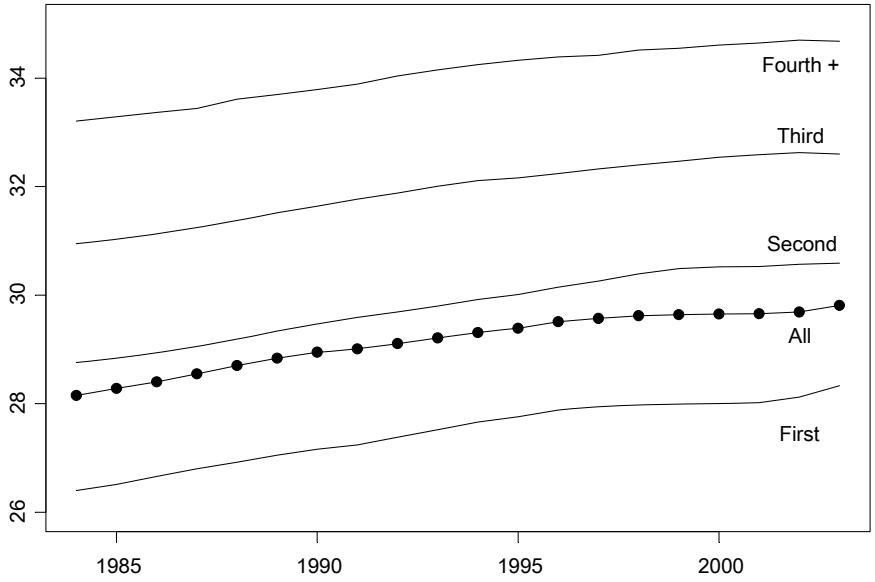


Figure 14. Fertility Decline with Different Measures

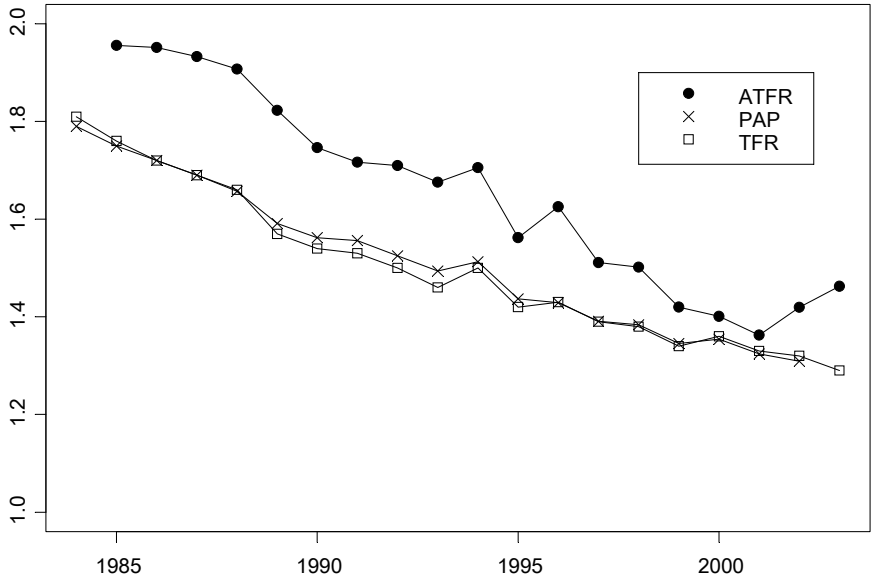


Figure 15. Eventual Parity Distribution

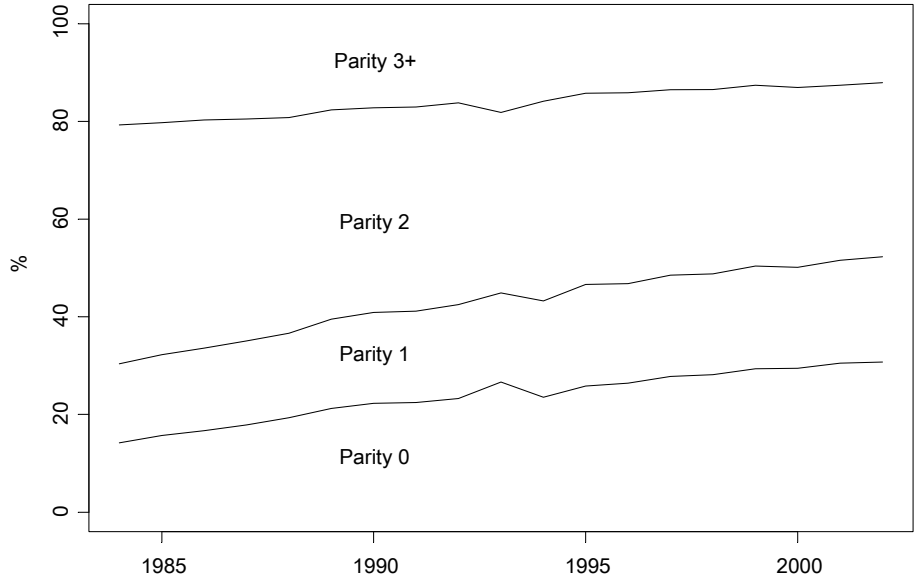


Table 1. Decomposition of Parity Progression

	1984	2002	Hypothetical PAP in 2002	Contribution of PPR	%
PAP	1.7899	1.3089			
PPR 0→1	0.8582	0.6926	1.44466	-0.34524	71.8
PPR 1→2	0.8109	0.6885	1.64925	-0.14065	29.2
PPR 2→3	0.2976	0.2525	1.75417	-0.03573	7.4
PPR 3→4	0.1203	0.1353	1.79350	0.00360	-0.7
PPR 4→5	0.1536	0.1644	1.79017	0.00027	-0.1
Residual				0.03677	-7.6

Figure 16. Female TFMR and TFR

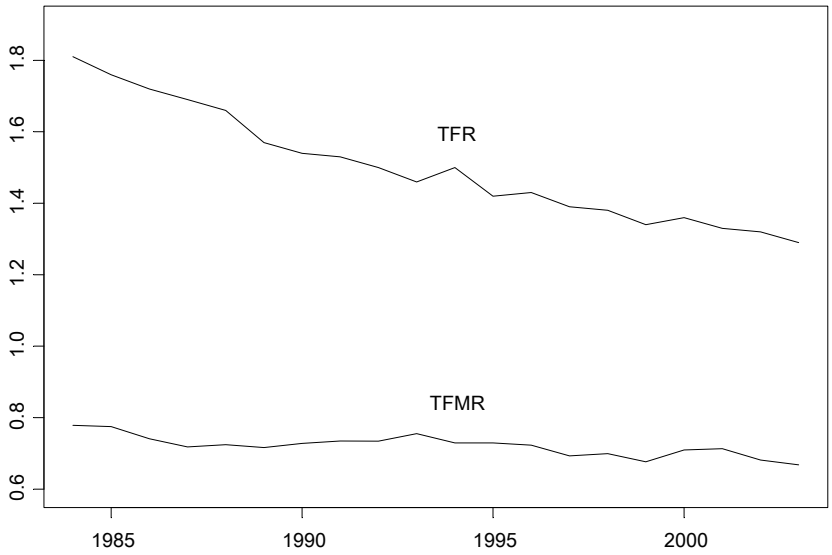


Figure 17. Female Mean Age at Marriage and First Birth

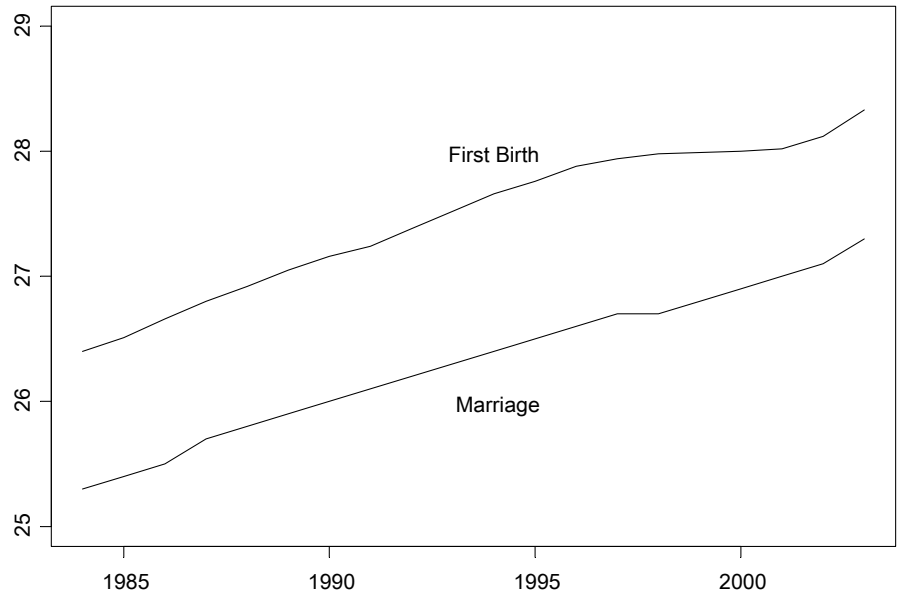
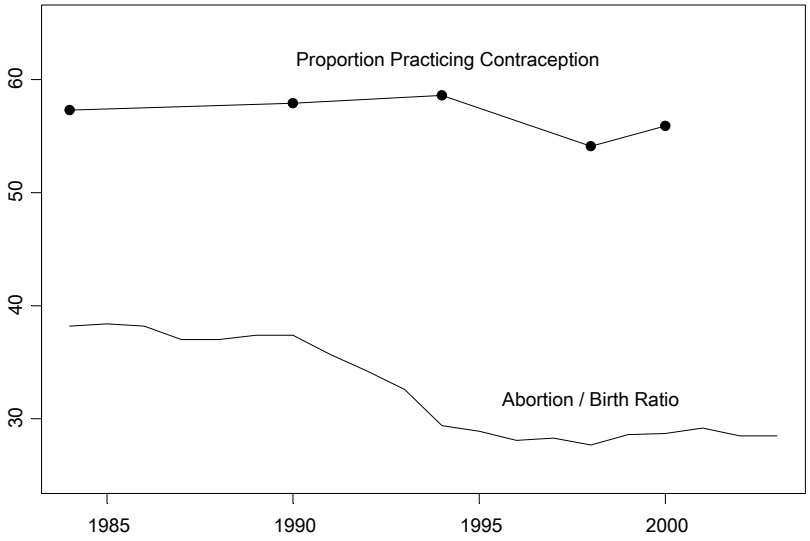
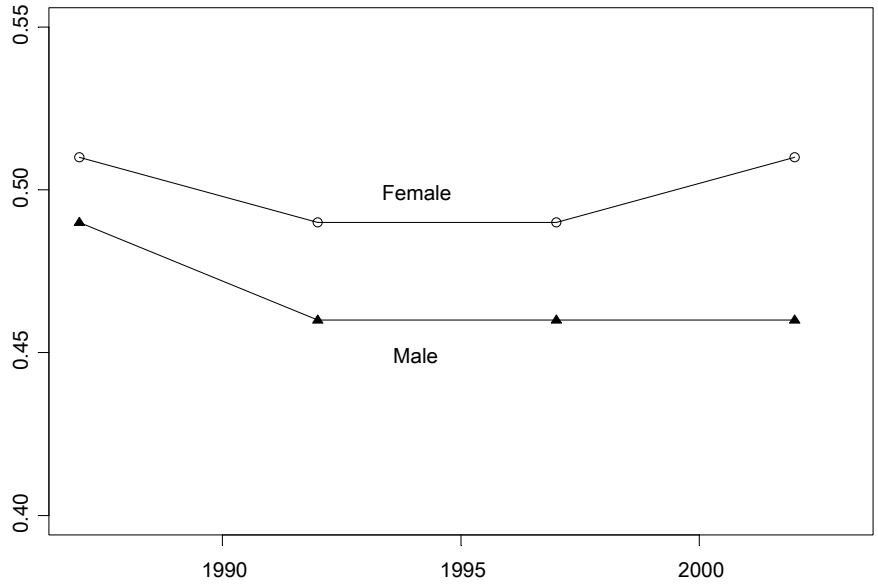


Figure 18. Contraception and Induced Abortion



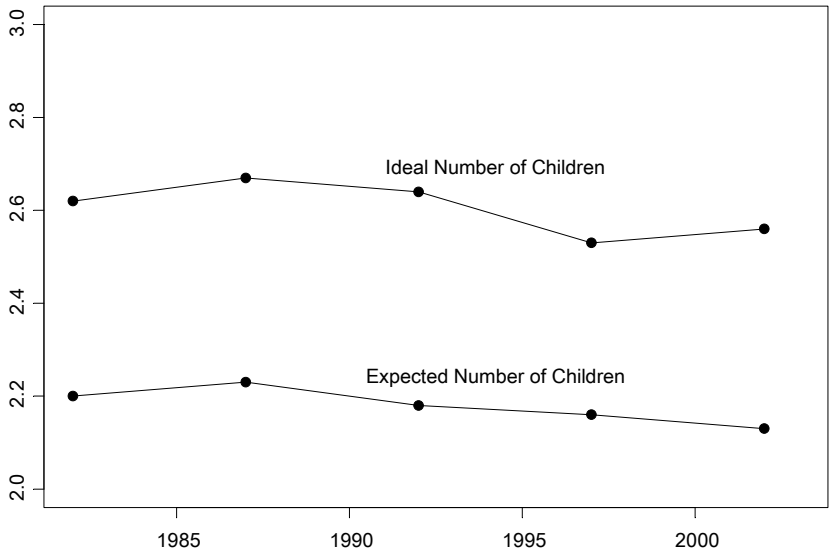
NIPSSR, Latest Demographic Statistics 2005

Figure 19. Intention of Marriage



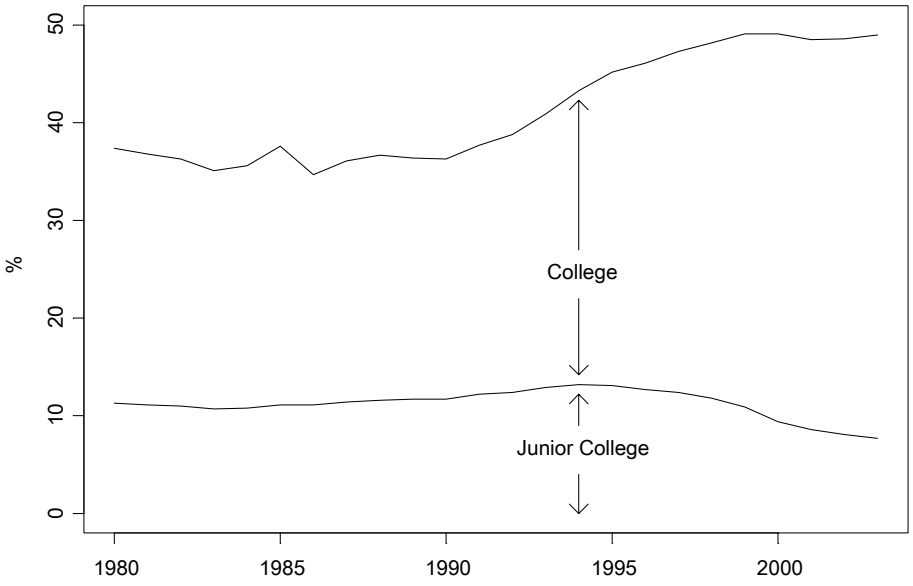
NIPSSR, National Fertility Survey

Figure 20. Demand for Children



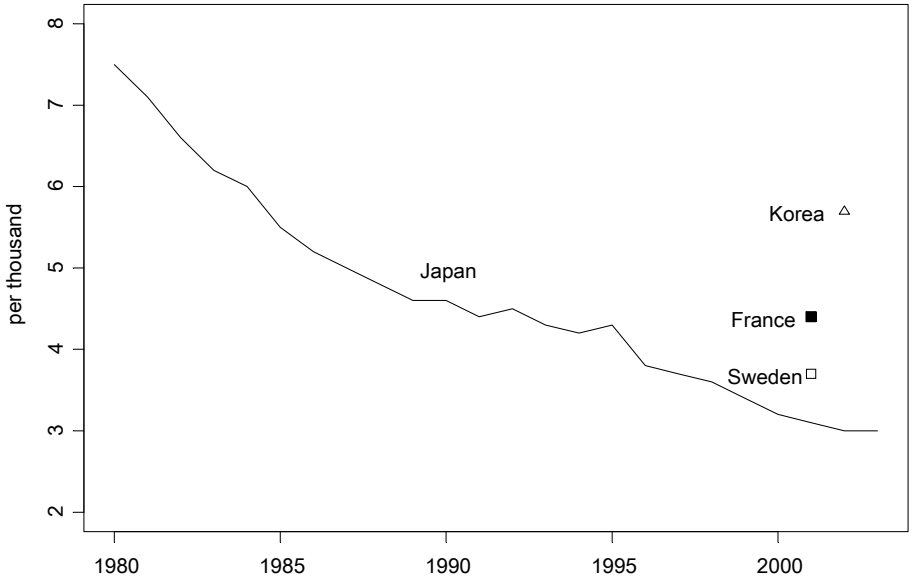
NIPSSR, National Fertility Survey

Figure 21. Enrollments in Junior College and College



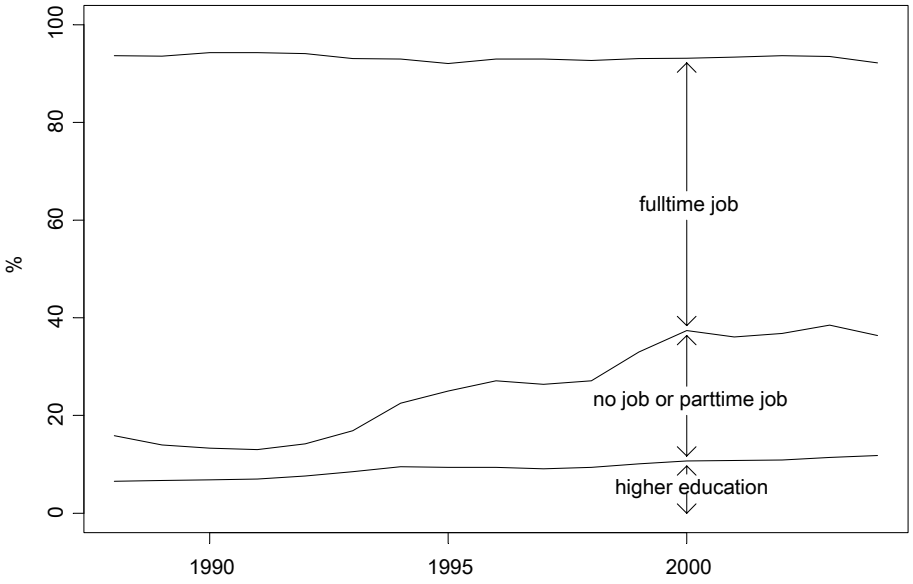
NIPSSR, Latest Demographic Statistics 2005

Figure 22. Infant Mortality Rate



NIPSSR, Latest Demographic Statistics 2005; KOSIS

Figure 23. States of College Graduates



School Basic Survey

Figure 24. Expectation on Future's Life

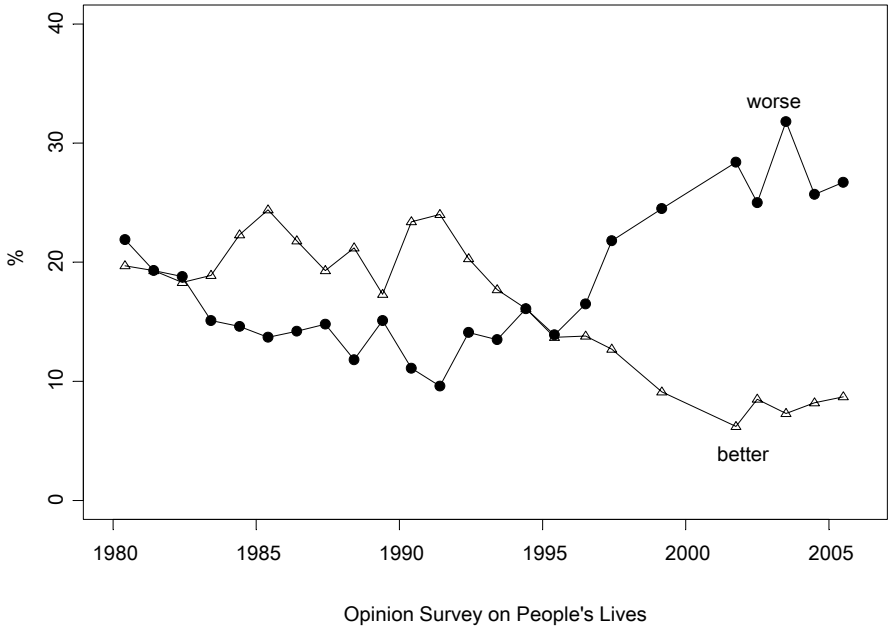


Figure 25. Female Labour and Fertility, 1985,90,95,2000,02

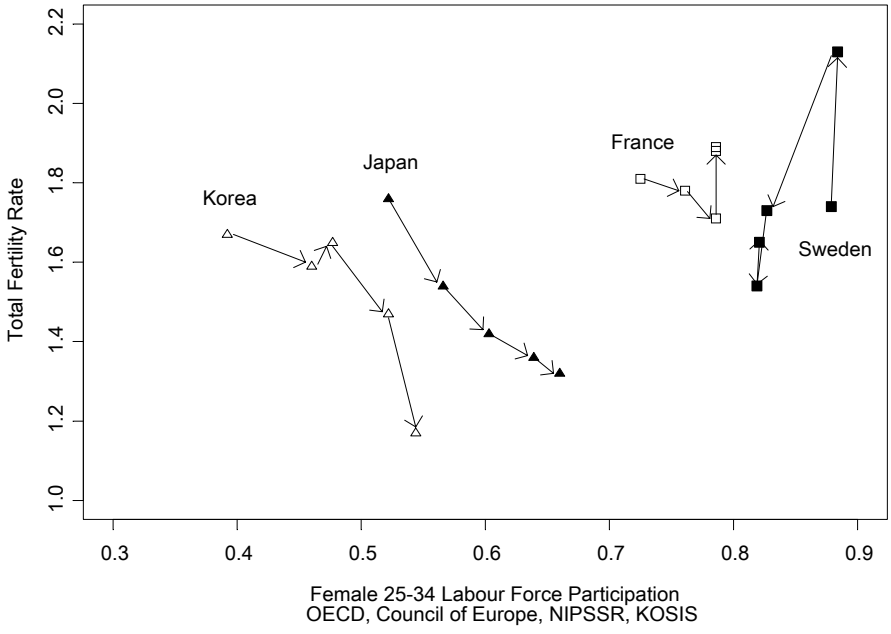
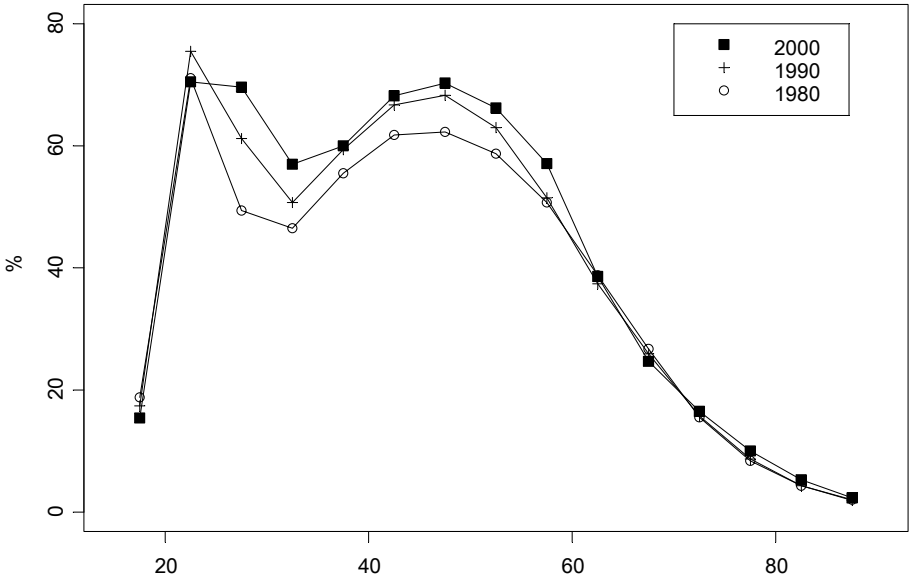
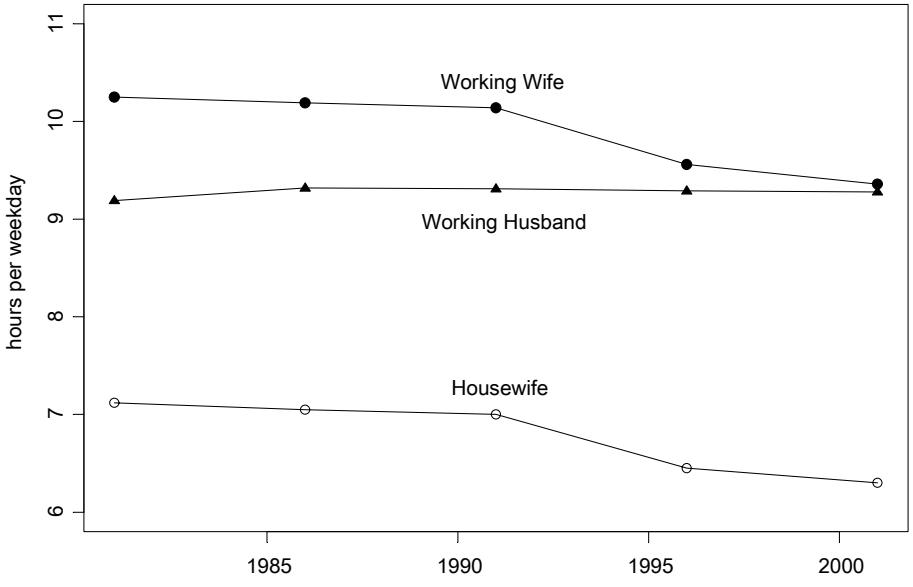


Figure 26. Female Labour Force Participation by Age in Japan



NIPSSR, Latest Demographic Statistics

Figure 27. Secondary Acitivity Hours of Married



Survey on Time Use and Leisure Activities

Table 2. Pro-natal Policy Interventions in Japan

Year	Policy Measures
1991	Government's Guideline "Toward Satisfactory Conditions for Healthy Childrearing" Amendments to Child Allowance Law Childcare Leave Law
1994	Angel Plan "Basic Direction for Future Childrearing Support Measures" (1994~1999) Amendments to Childcare Leave Law
1997	Amendments to Child Welfare Law
1999	New Angel Plan "Basic Measures for Decreasing Children" (1999~2004) Low-dose oral contraceptive pill legalized
2000	Amendments to Childcare Leave Law Amendments to Child Allowance Law
2002	Ministry of Health "Measures for Decreasing Children Plus One"
2003	Law for Measures to Support the Development of the Next Generation Law for Measures to Cope with Dereasing Children Society Amendment to Child Allowance Law
2004	New-New Angel Plan "Plans to Support Children and Childrearing" (2004~2009)

Figure 28. Child Allowance for a Family with Two Children

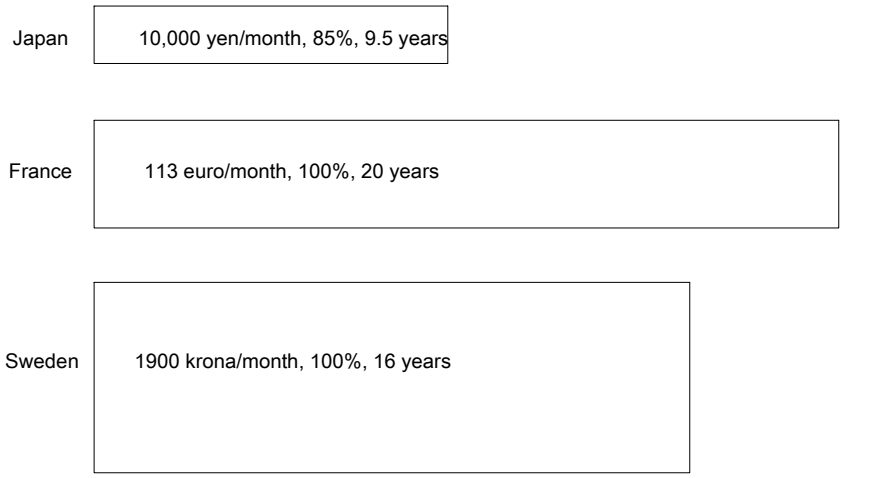


Figure 29. Maternity Leave for a Family with Two Children

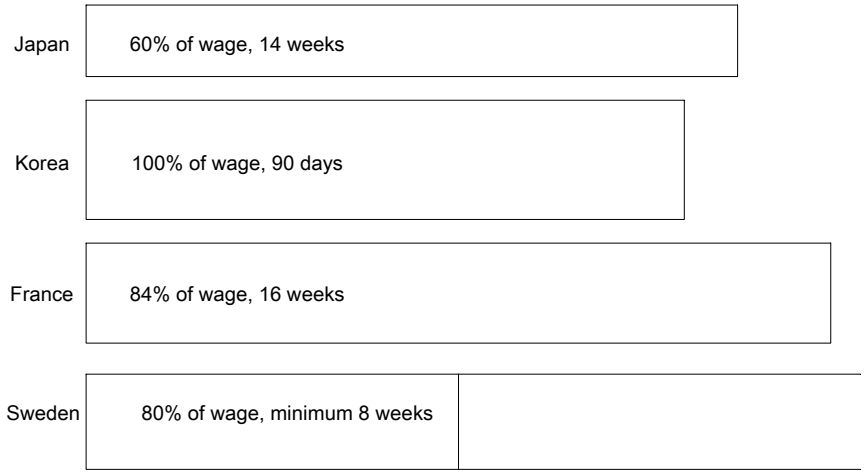


Figure 30. Childcare Leave for a Family with Two Children

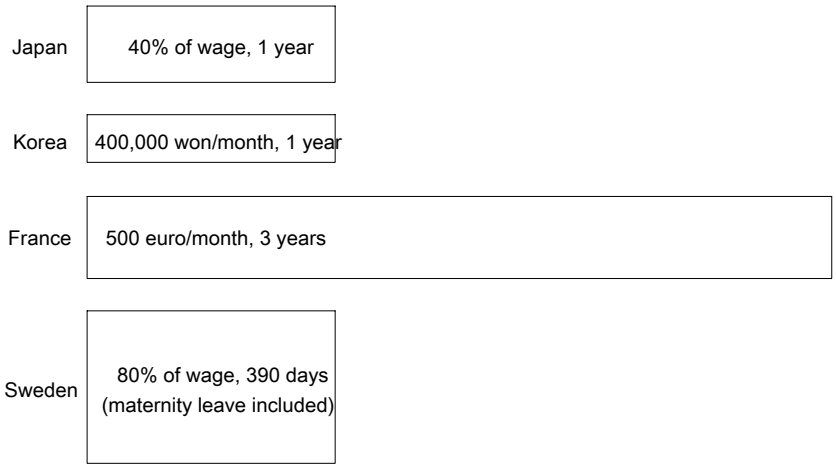
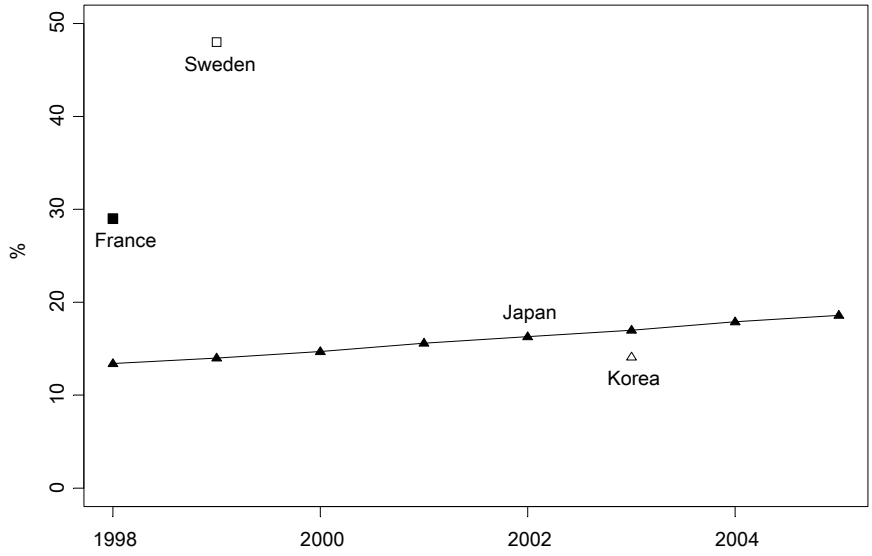


Table 3. Effect of Childcare Leave in Japan

Literature	Suruga and Nishimoto (2002)	Shigeno and Matsuura (2003)	Yamaguchi (2005)	Suruga and Chang (2003)
b	0.0231	0.1244	0.1886	0.22298
exp(b)	1.0234	1.1325*	1.2076*	1.2498
Fertility without leave (f_0)	0.0368	0.0364	0.0362	0.0361
Fertility with leave (f_1)	0.0376	0.0411	0.0434	0.0447
Current TFR	1.29	1.29	1.29	1.29
Hypothetical TFR	1.2873	1.2751	1.2669	1.2623
Difference	-0.0027	-0.0149	-0.0231	-0.0277

* exp(b/5)

Figure 31. Proportion of Children Enrolled in Daycare Center



Children and Families Bureau, MHLW; OECD Note on Korea; Choi EY (2004)

Figure 32. Area with Negative Correlation for Different g

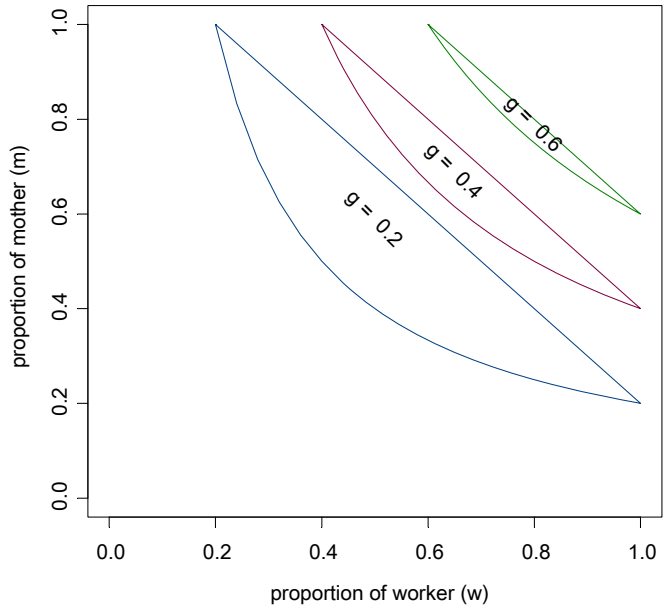
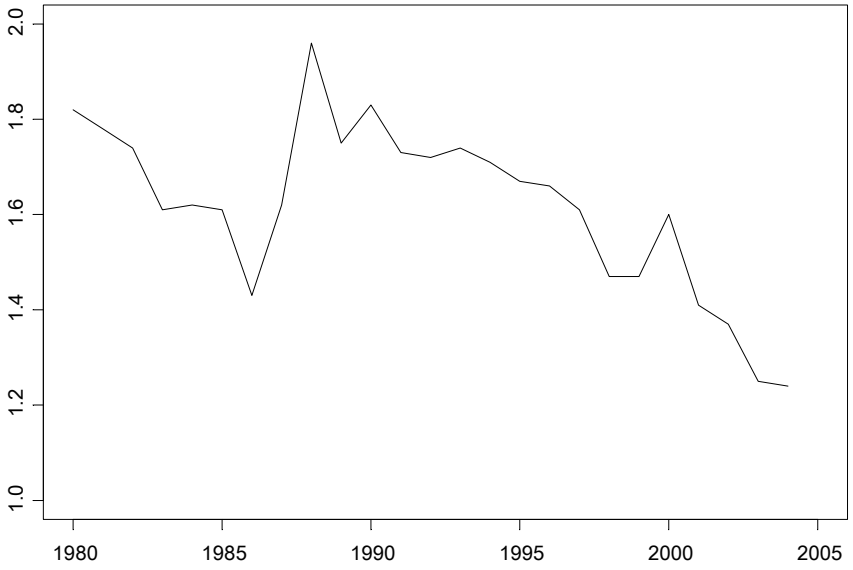
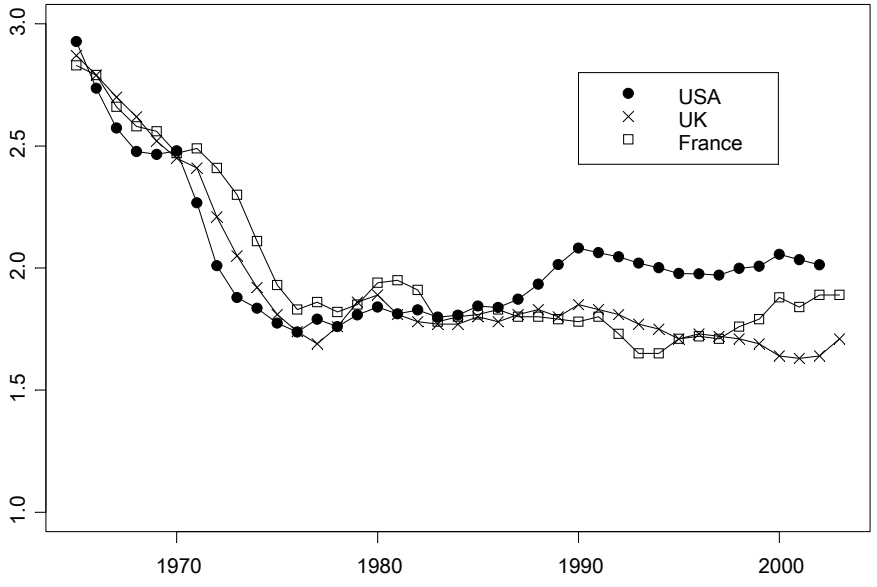


Figure 33. TFR in Singapore



Singapore Department of Statistics, Population Trend 2005

Figure 34. TFR in France, UK and USA



Council of Europe, US Census Bureau, NCHS

Table 4. Distribution of Married Women by Work Status and Presence of Child

Age					
25~29	Year 1992		Not Mother	Mother	
		Not Worker	14.3	46.6	60.9
		Worker	19.0	20.1	39.1
			33.3	66.7	100.0
	Year 2002		Not Mother	Mother	
		Not Worker	13.1	42.8	56.0
		Worker	22.8	21.2	44.0
			36.0	64.0	100.0
Age					
30~34	Year 1992		Not Mother	Mother	
		Not Worker	6.9	47.8	54.8
		Worker	8.5	36.7	45.2
			15.5	84.5	100.0
	Year 2002		Not Mother	Mother	
		Not Worker	8.2	48.7	56.9
		Worker	12.9	30.2	43.1
			21.2	78.8	100.0

Table 5. Lowest-Low Fertility after 2000

Region	Country	2000	2001	2002	2003	2004
Eastern Asia	Japan	1.36	1.33	1.32	**1.29**	**1.29**
	Republic of Korea	1.47	**1.30**	**1.17**	**1.19**	**1.16**
	Taiwan	1.68	1.40	1.34	**1.24**	**1.18**
Southern Europe	Bosnia and Herzegovina	1.34	1.44	**1.23**		
	Greece	**1.29**	**1.25**			
	Italy	**1.24**	**1.23**			
	San Marino	**1.24**		**1.19**		
	Slovenia	**1.26**	**1.21**	**1.21**		
	Spain	**1.24**	**1.26**	**1.25**		
Eastern Europe	Bulgaria	**1.30**	**1.24**	**1.21**		
	Czech Republic	**1.14**	**1.14**	**1.17**		
	Hungary	1.32	1.31	**1.30**		
	Poland	1.34	**1.29**	**1.24**		
	Romania	1.31	**1.27**	**1.26**		
	Slovak Republic	**1.30**	**1.20**	**1.19**		
Former USSR	Armenia	**1.11**	**1.02**	**1.21**		
	Latvia	**1.24**	**1.21**	**1.24**		
	Lithuania	1.39	**1.30**	**1.24**		
	Moldova	**1.30**	**1.25**	**1.21**		
	Russian Federation	**1.21**	**1.25**	1.32		
	Ukraine	**1.09**		**1.10**		

(Source)
Japan: Statistics and Information Dpt., MHLW
Korea: Korea National Statisitics Office
Taiwan: Taiwan Directorate-General of Budget, Accounting and Statistics
Europe: Council of Europe, Recent Demographic Development in Europe 2003

Table 6. Expected TFR Decline by Abolishment of Policy Measures

	(min)		(max)
Child Allowance	-0.0057	~	-0.0167
Tax Relief	-0.0143	~	-0.0417
Childcare Leave	-0.0027	~	-0.0277
Total	-0.0226	~	-0.0861

Table 7. Expected TFR Increase by Introduction of French or Swedish Child Allowance System

	French System	Swedish System
Expected Increase in Monthly Benefit (yen)	2,115	14,137
Expected TFR Increase by Oyama's Coefficient	0.0021	0.0141
Expected TFR Increase by Yamagami's Coefficient	0.0062	0.0414

Figure 35. Median Age at Home-Leaving of Cohorts Born around 1

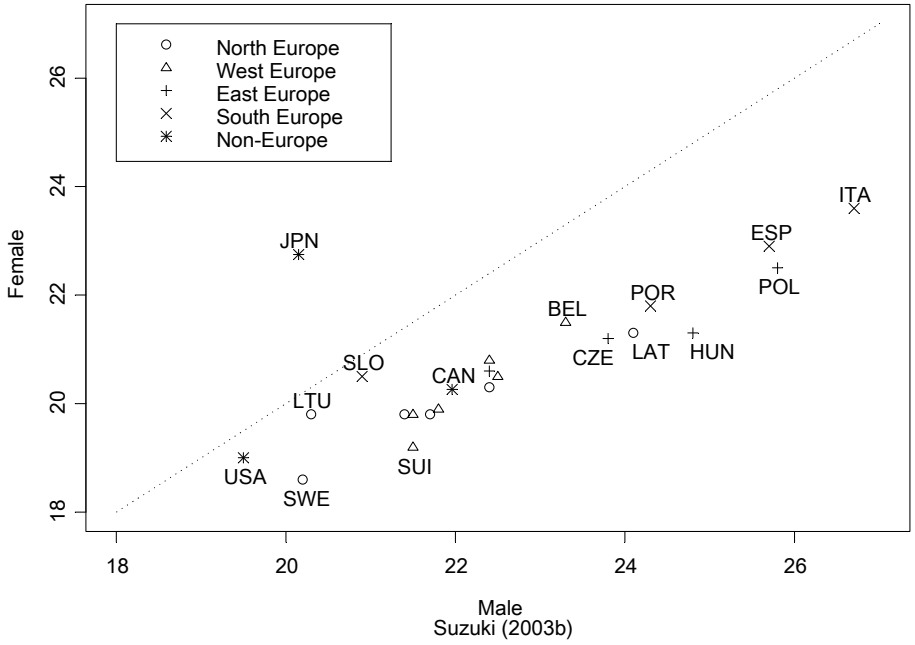


Figure 36. Proportion of Extramarital Births