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Fertility Decline and Policy Development in Japan

Toru Suzuki

Abstract

Japan's TFR in 2004 was 1.29, which is "lowest-low" fertility, i.e. having a TFR of 1.3 or less. It seems to be impossible for cohorts born after 1960 to achieve the complete fertility of their 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 the direct cost of children is attributable to growing human investments in the 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 having 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, etc. However, pronatal measures are not as effective as expected. Quantitative analyses show that it is very difficult to elevate the TFR by 0.1 with policy interventions. 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 the lowest-low level.

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

Key Words: fertility decline, pronatal policy

Introduction

Japan is now entering a new demographic phase. After the population growth that tripled the 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 a natural decrease in the first half of 2005. If the annual number of deaths eventually exceeds that of births and is not compensated for by the net immigration, Japan will become a country with a declining population this year.

Needless to say, 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. The Total Fertility Rate (TFR) of Japan was 1.29 in 2004, which is lowest-low fertility, i.e. 1.3 or less (Kohler et al., 2002). The momentum of population growth in the past enabled the Japanese population to grow for three decades after fertility fell below replacement level. However, the momentum in Japan is fading and the population decline is an unavoidable destiny.

It is thought that extremely low fertility results in rapid population aging, decline in working age population, and a sharp increase in the dependency ratio. Such demographic changes would cause many serious problems including a crisis of public pension system, labor shortages, 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 recent fertility decline and analyzes its determinants. Then, it describes policy measures taken in Japan and evaluates their effects. The final section discusses the cultural patterns that differentiate fertility and the future of lowest-low fertility in Eastern Asia.

1. Recent Fertility Decline and Its Determinants

1-1. Cohort Fertility

The Complete Fertility Rate (CFR) of a real cohort is a more desirable measure than the TFR, because the latter suffers from tempo distortion and the parity composition effect (Ortega and Kohler, 2002). The problem is that the CFR cannot be determined until the cohort completes its reproduction. However, the CFR of cohorts in their forties is

predictable because only a small number of births will be added to the current level. Figure 1 displays the 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 the early twenties, it succeeded in catch up and will fulfill a near replacement level. However, a significant decline in the CFR for cohorts born after 1960 seems to be inevitable. The 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 the CFR for cohorts born after 1965, the postponement in the early twenties seems too serious to be compensated later. Thus, the 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).

1-2. Period Fertility

In many countries with very low fertility, there is a secular trend of postponement of childbearing. This is also the case in Japan. Figure 2 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 first birth, which age jumped from 28.0 in 2001 to 28.3 in 2003.

Such a postponement in childbearing causes "tempo distortion" that the TFR is depressed to an undesirably low level. Bongaarts and Feeney (1998) proposed a measure to remove tempo distortion from the TFR. Their ATFR (Adjusted Total Fertility Rate) is a hypothetical TFR that would materialize if there were no delay in childbearing.

Another deficiency of the TFR is that it is based on "incidence rates" that do not refer to the population at risk. The denominator of incidence rate is female population by age without considering parity. On the other hand, the theoretically desirable occurrence / exposure ratio is called "intensity" of birth (Ortega and Kohler, 2002, p. 4) and given as the ratio of age-parity specific births to age-parity specific female population. 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 the 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 the TFR and the ATFR.

Figure 3 shows these three indices of fertility. The difference between the 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 the TFR. The difference between the 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.

1-3. Nuptiality

Extramarital births are rare in Japan, accounting for only 1.93% of all births in 2003. Thus, a fall of nuptiality directly results in a fall of fertility. Figure 4 compares the TFR and female TFMR (Total First Marriage Rate) between 1984 and 2003. The TMFR is an estimate of the proportion ever married at age 50 of a hypothetical cohort without death. This proportion dropped more moderately than the TFR. While the TFR fell by 28.7% during this period, TFMR of Japanese women fell only by 14.3%.

Figure 5 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, the 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). Though such analyses always say that the recent fertility decline in Japan was caused solely by the nuptiality decline, the result is not reliable because of the deficiencies in AMFRs (Hirosima, 2001; Suzuki, 2004). 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 the 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 the remaining 39.4% to tempo distortion. Hirosima (2000) attempted to decompose the effect of tempo distortion on marriage and childbearing. His result shows that quantum and tempo of marriage account for approximately 70% of the 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 with the delay in marriage. He concluded that 73.7% of the 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 the estimated cohort fertility to period fertility, she had a similar result as Hirosima (2000), i.e. that approximately 70% of the TFR decline between 1970 and 2000 was due to nuptiality decline. Suzuki (2005) applied the simplified method of Iwasawa to Japan and Korea, assuming that marital fertility does not depends on the age at marriage but solely on the marriage duration. The result showed that 37% of the 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 the 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 their relative importance varies over time.

1-4. Proximate Determinants

Since marriage does not explain the fertility decline in its entirety, 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 6, 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 in favor of male methods (Atoh, 2000, p. 108). Condom accounted for 75.3% of all contraceptive methods (multiple answers) in 2000, while the pill and IUD accounted for only 4.2%. It was as late as in 1999 that the low dose pill was legalized in Japan. Because there were worries about an expansion of STDs, access to the 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 of an increasing number of unwanted pregnancies. As shown in Figure 6, the ratio of abortions to births dropped in the early 1990s and sustained a 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 miscarriages 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 the 4.9% in 1984 and 4.4% in 1990. It is said that many mothers in Japan have stopped breastfeeding by 1.5 years after the birth. Thus, 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 increasing 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 hormones, and sexually transmitted diseases (Semba, 2002). However, quantitative evaluations of such hypotheses will be difficult due to the lack of necessary data.

1-5. 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 7 presents the trend in marriage intention scores of single men and women less than the age of

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 will wait for the ideal mate"
0.4 "Not yet but at a particular age"
0.6 "Marry if the ideal mate appears but keep waiting if not"
0.8 "Marry if the ideal mate appears but stop waiting at a particular age"
1.0 "Want to marry within a year"

Figure 7 indicates that there was an increase in intention of marriage among women between 1997 and 2002. Thus, there is no evidence of 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.

Figure 8 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. Both were well above the replacement level.

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), the individualistic attitude has increased only moderately in Japan. Although attitudes toward gender relationship and care for 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 fulfilling the demand. We will examine such obstacles in the following sections.

1-6. 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 becomes higher (Becker, 1981; Willis, 1994). The rising cost of children including public and private educational costs 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 9 depicts the change in the college enrollment rate in Japan since 1980. Enrollment rose rapidly in the 1990s and was stagnated after 2000. However, the shift from junior college to college is proceeding. In Japan, the governmental support for 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). The availability of scholarships is also limited. For those reasons, Japanese parents are suffering from the financial cost of children more seriously than parents in other developed countries.

Human capital investments other than formal education are also increasing. Figure 10 shows the decline in the IMR (Infant Mortality Rate) in Japan since 1980. Though the pace of decline slowed down recently compared to the 1980s, the IMR in Japan is still decreasing. The current level of 3 per thousand is among the lowest in the world. Such an achievement cannot be made freely but both government and parents are paying for it. There seems to be a trend of Japanese parents becoming more protective and spending more money on the health and education of their children.

1-7. Economic Recession and Labor Market Condition

Young people that grew up in the period of rapid economic growth tend to have high aspirations for their future lives. When the economy slows down, however, the labor market conditions for the young workers become 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, the economy was bad throughout the 1990s. The unemployment rate rose sharply from 2% in 1990 to 5% in 2003. The tight labor market conditions seriously discouraged the career achievement of the youth. Figure 11 shows the labor force status of college graduates immediately after 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 temporary job increased from 9.4% to 24.6% during the same period. The proportion proceeding to higher education increased from 6.5% to 11.8%.

According to Nagase (2002, pp. 27-28), part time work significantly reduces the hazard of first marriage for both men and women. While the hazard rapidly rises between age 24 and 27 for women working on a 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 their 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 the 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 12 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 get better" than those who answered "will get

worse". During the 1990s, however, the answer "worse" continuously increased and exceeded "better" around 1995. In June, 2005, the pessimistic attitude surpassed the opportunistic one by 18 percentage points. It is thought that such uncertainty about the future is one of the major sources of lowest-low fertility in recent Japan.

1-8. 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 the 20th century was the rising economic power of women. The expanding occupational opportunities 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 the divorce rate. These changes resulted in the increase in female-headed households, cohabitation, and extramarital births.

The theory predicts the negative impact of female labor force participation on fertility. Actually, numerous empirical studies verified the negative effect of wife's work on fertility at the micro level (Asami et al., 2000; Oi, 2004; Oyama, 2004; Sasai, 1998; Shichijo and Nishimoto, 2003; Tsuya, 1999; Fukuda, 2004; Fujino 2002; Yashiro, 2000; Yamagami, 1999; Yamaguchi, 2005). At the 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).

In Japan, the incompatibility between female labor and fertility is expressed in an M-shaped curve of age-specific participation rates. Although an 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 the ability and opportunity to work but they have to give up their career on childbearing. Such incompatibility is attributed to the remaining gender role attitude, low participation of the husband in housework, characteristics of the labor market, and underdevelopment of family friendly policy (Atoh and Akachi, 2003, p. 35; Meguro and Nishioka, 2000).

As far as gender equity in the domestic area is concerned, Japan is much lower than other developed countries. Japanese husbands spend considerably shorter time on housework than 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). According to the proposition by McDonald (2000, p. 437) that "When gender equity rises to high levels in individual-oriented institutions while remaining low in family-oriented institutions, fertility will fall to very low levels", Japan has a good reason to have very low fertility.

2. Governmental Policy Interventions

2-1. Development of Policy Measures

Table 1 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 devise 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 to the budget. The Childcare Leave Law (formally the "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 was enforced in April 1992.

In December 1994, the government publicized the Angel Plan for the five-year 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 payment of social security premium in 1994. In 1997, a major revision was made to the Child Welfare Law to provide satisfactory daycare services for working mothers.

In December 1999, the government made the New Angel Plan for the period between 1999 and 2004. This document asserted the need to improve gender equity and working conditions. 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 coverage was expanded from children less than three years old to all 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 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 required 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 coverage to children in 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 support and improving gender equity. In addition, the document pointed out the importance of economic independence of the youth. This was a response to the increasing number of "freeters" (temporary workers) and "NEETs" (young people Not in Employment, Education or Training).

2-2. Child Allowance and Tax Relief

The Child Allowance of Japan started in 1971. At that time, only children of the third and higher order, less than five years old, whose 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. The age limit was raised to all preschoolers in 1974 but lowered again to three years old in 1985 (Oshio, 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 subsequent 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 grade of primary school, namely until March after turning 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 the high income of their parents.

Yamagami (1999, p. 59) stated that a monthly allowance of 200,000 yen is necessary to elevate the 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, the 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.

2-3. 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 the public health insurance system. 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).

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 a cash benefit of 25% of wage and exemption from social security premiums 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 work. 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 a daycare center is not available. However, no cash benefit is paid in either case for the prolonged period.

According to the Basic Survey of Employment Management of Women in 2003, 73.1% of female workers who gave birth in 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 all mothers were eligible for childcare leave. Though there is no fine data set to distinguish reasons of ineligibility, it is apparent that many mothers are excluded from the current childcare leave system.

There are several studies that evaluate the effect of childcare leave on fertility in Japan. Table 2 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 one who cannot, $\exp(b)$ gives a odds ratio. Because Shigeno and Matsuura (2003) and Yamaguchi (2005) analyzed fertility of a five-year period, $\exp(b/5)$ is shown in the table. If we express the average fertility rate of a female who cannot take childcare leave as f_0 and that of who can take as f_1, the 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 as p, then the TFR can be written as follows;

$$TFR = 35\{(1-p)f_0 + p\, f_1\}.$$

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 an adequate value for each parameter. In Table 2, TFR=1.29 and p =0.092 were applied. If there were no childcare leave in Japan, the TFR would be lower than today by 0.0027 or 0.0277. While Suruga and Nishimoto (2002) used the Basic Survey of Employment Management of Women by the former Ministry of Labour, three other studies used the 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.

2-4. Childcare Service

The compatibility between female work and childrearing has been the primary political goal of the 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 shifted 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 the 23,338 children on the waiting list, 15,831 (67.8%) were under two years old. This accounts for 0.47% of the population under age two.

There were 632,011 children under age two (18.6% of the population) in daycare center in April 2005. Since the proportion was 13.4% in 1998, there was an increase by 5.2 percentage points by 2005. However, such an improvement in childcare service does not seem to have contributed to fertility 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 understanding 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 the work status of a wife and presence of a child to be negatively correlated, g must be smaller than the expected value of the independence model.

$$g < w\,m.$$

If we coordinate the proportion of

workers (w) on the horizontal axis and that of mothers (m) on the vertical axis, the area enclosed by a straight line and a hyperbola simultaneously satisfies two conditions above. Figure 13 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 in the 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 the micro level.

Table 3 shows contingency tables of wife's work status and the 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 their early 30s, the proportion of working mothers decreased from 36.7% in 1992 to 30.2% in 2002. In the 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.

Some analyses of micro data identified the effect of childcare services on the work status of wives. For example, Oishi (2003) found that the cost of daycare service has negative impact on a 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. Low Fertility and Policy Intervention in Comparative Perspective

3-1. Spread of Lowest-Low Fertility in Europe and Asia

Lowest-low fertility appeared in Europe during the 1990s causing a drastic change in the 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, latecomers showed unexpected declines to lowest-low fertility. This change caused not only a 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 4 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 on 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 areas. In Southern Europe, Bosnia-Herzegovina joined the group recently. It turned out that the TFR of San Marino was already at the lowest-low level in the mid 1990s. In Eastern Europe, Poland and Slovakia are newcomers. 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 moved out of the group with the recent upswing of the TFR. Russia also came out of the group in 2002.

3-2. Effectiveness of Pronatal Policy

Table 5 summarizes the estimated effects of current policy interventions on the TFR in Japan. Child allowance is supposed to raise the 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 the TFR by between 0.0027 and 0.0277. If these effects were additive, the TFR would decline by between 0.0226 and 0.0861 if these measures were abolished. Then, the TFR in Japan would fall between 1.20 and 1.27 instead of 1.29 today. Needless to say, this is a very rough estimate ignoring various heterogeneities and relying on oversimplified assumptions. Still, it can be said that the elasticity of fertility is so small that it would be difficult to elevate the TFR by 0.1.

Even if policy intervention is successful, its effect is not necessarily lasting. Figure 14 displays the trajectory of the TFR in Singapore. In March 1987, Singapore started a new population policy. Under the slogan of "Have three or more, if you can afford it", such pronatal measures were enforced as tax relief for the third and subsequent children, subsidization of daycare cost, and housing privilege for a large family (Sasai, 2005, pp. 466-467). As a result, the TFR jumped from 1.43 in 1986 to 1.96 in 1988. However, the TFR started declining again from 1989, though it took 15 years to drop to the level of 1986.

3-3. Cultural Deterministic View on Fertility

There is a cultural divide between moderately low fertility and lowest-low or very low fertility. As suggested in Table 4, all 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 Nordic countries, all English-speaking countries, and all French and Dutch speaking Western European countries have TFR of 1.5 or higher. The countries with very low fertility are all advanced Eastern Asian countries, all Southern European countries and all German-speaking Western European countries. While emphasizing the role of policy intervention, McDonald suggested that this divide has deep historical roots and is difficult to change. Atoh (2005, pp. 51-52) pointed out the influence of traditional values as one of factors beyond 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 respect, 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 deep historical roots. 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 the 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. In contrast, 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 that "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 the pre-industrial era, young men and women left the parental home before marriage to work as servants (Reher, 1998; Wall, 1999). The tradition of the majority of men and women leaving 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, which discourages autonomy and decision making ability in their own lives (Dalla Zuanna, 2001; Livi-Bacci, 2001). As shown in Figure 15, Japan occupies a singular position in 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 may suffer from the same problem as Southern Europeans.

Last but not least, a clear cultural divide in cohabitation and extramarital birth 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 16, 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, cease overprotecting children, flatten continuously rising cost of children, and socialize childrearing.

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 the direct effects of cultural features, not to governmental efforts. It is just a fantasy that the TFR would return to a 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, which has a long historical background. It is questionable if a consensus can be made that a government should promote early home-leaving of young people. No one would approve a policy to induce extramarital births by increasing the number of welfare mothers. Therefore, continuous fertility recovery will be impossible without a radical change in the family pattern. Although there is a sign of assimilation with the Western-Northern weak family pattern in Southern Europe as shown in Figure 16, it would be more difficult for such a change to take place in Eastern Asia. Hence, it is possible that lowest-low fertility in Eastern Asia will last longer and fall further than that of the European forerunners.

NOTE

[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.

[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.

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Toru Suki

(National Institute of Population and Social Security Research)

Figure 1. Cohort Cumulative Fertility Relative to 1950 Cohort

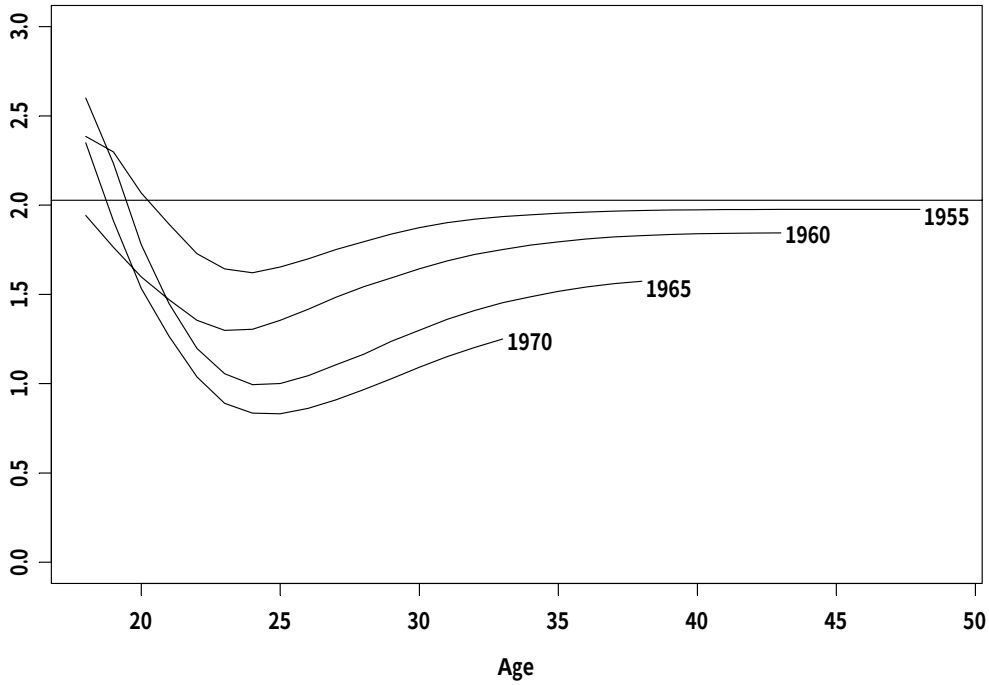


Figure 2. Mean Age at Birth by Birth Order

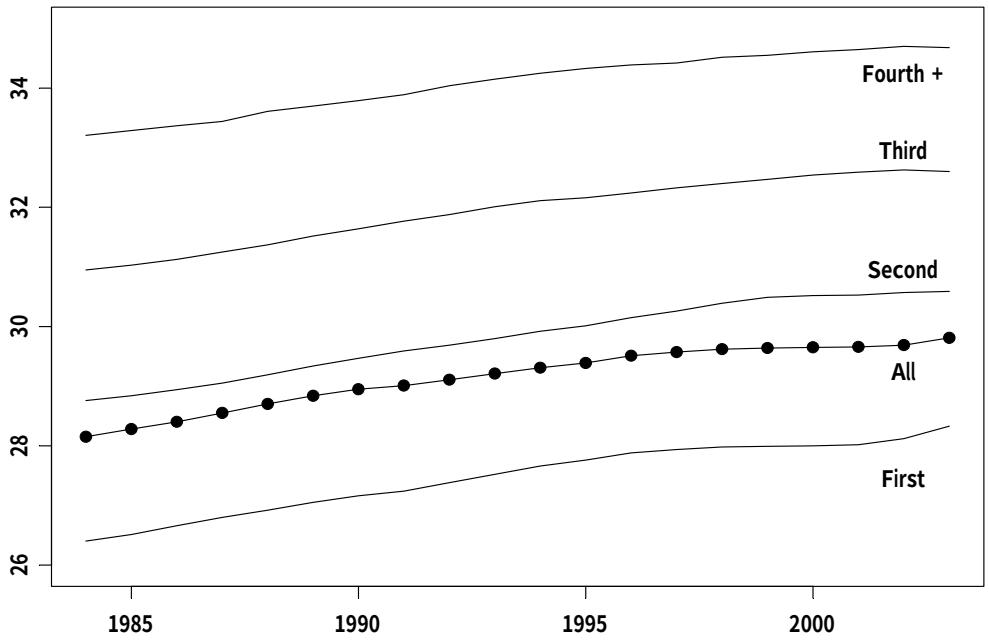


Figure 3. Fertility Decline with Different Measures

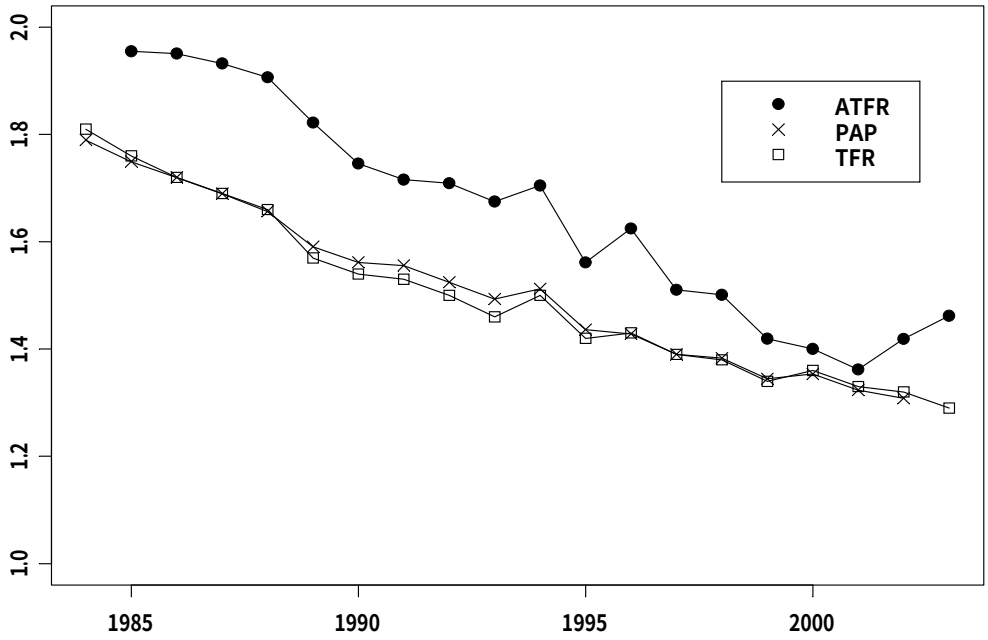


Figure 4. Female TFMR and TFR

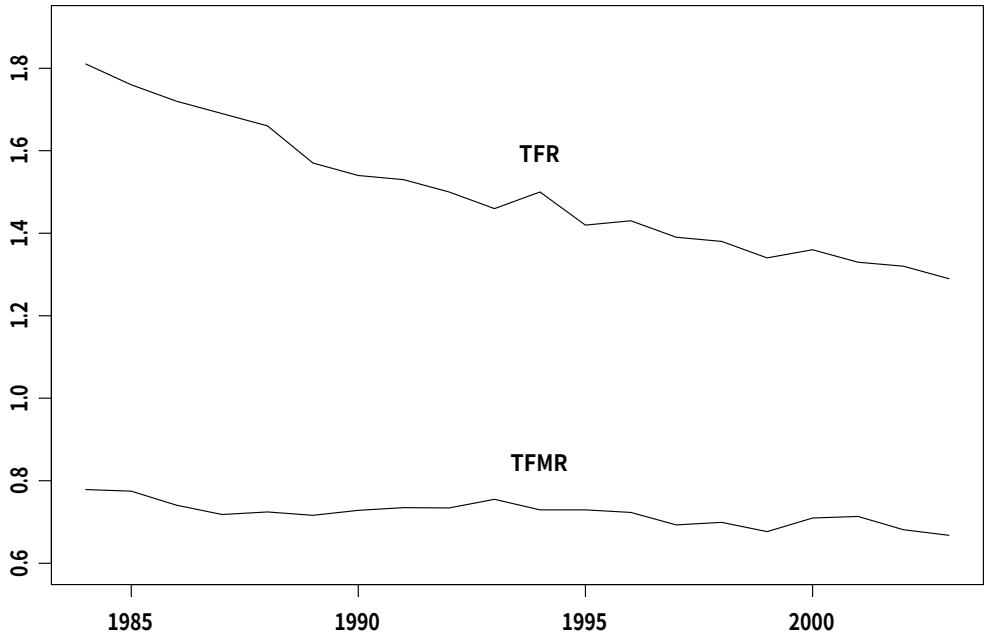


Figure 5. Female Mean Age at Marriage and First Birth

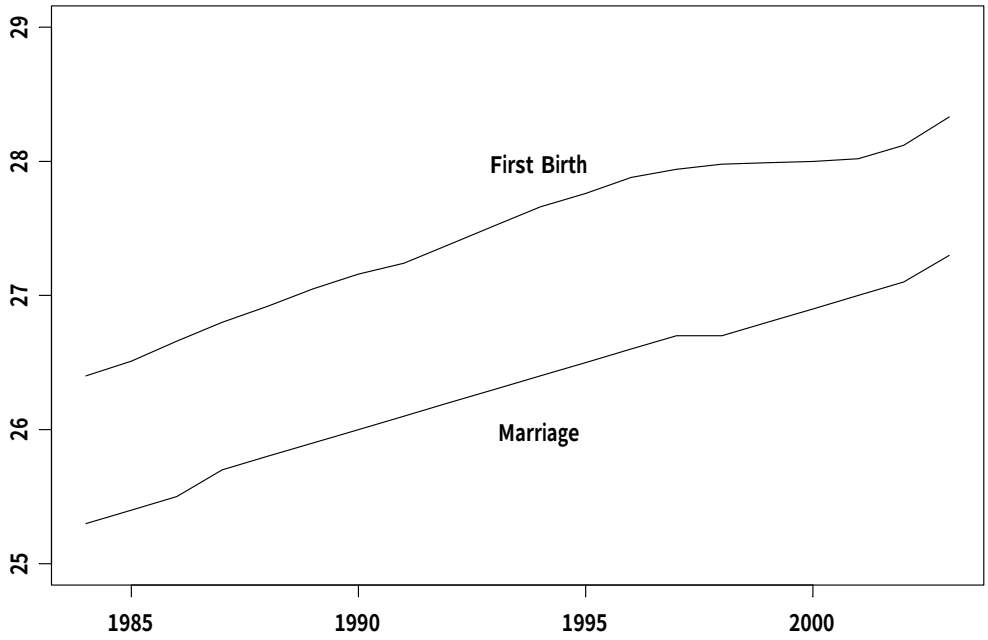
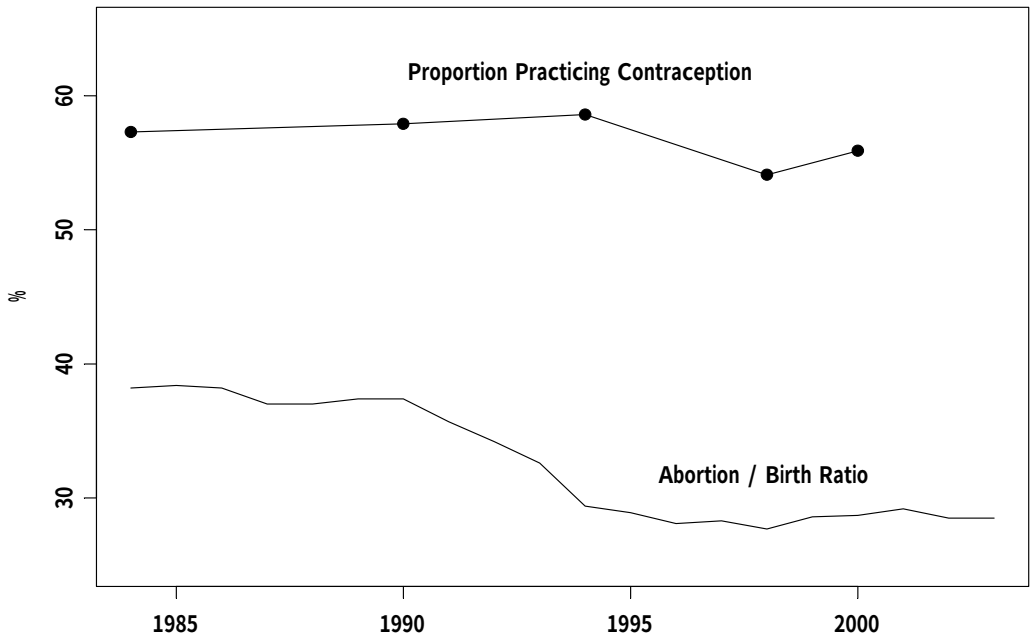
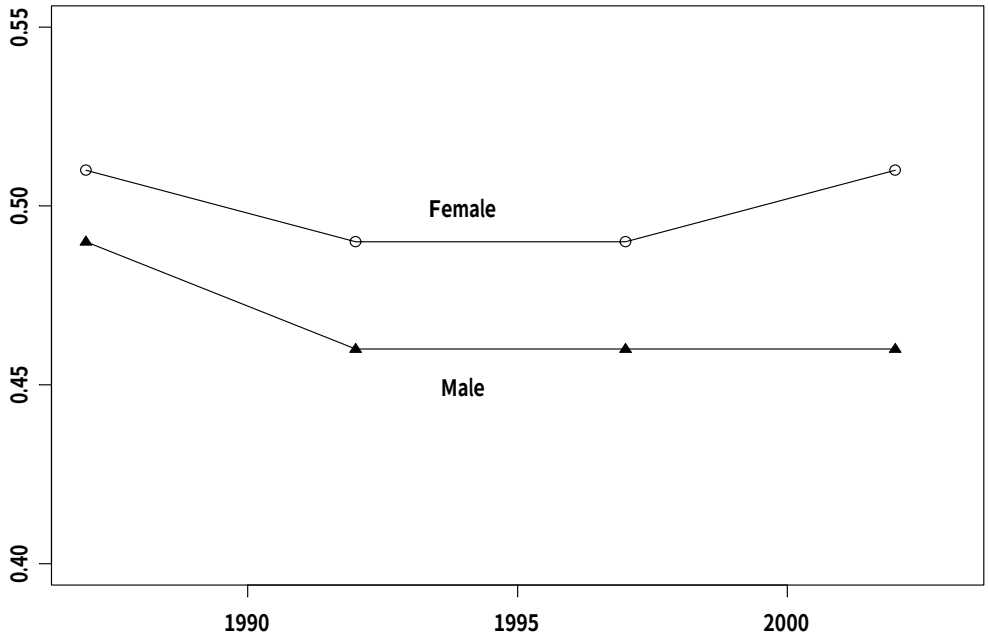


Figure 6. Contraception and Induced Abortion



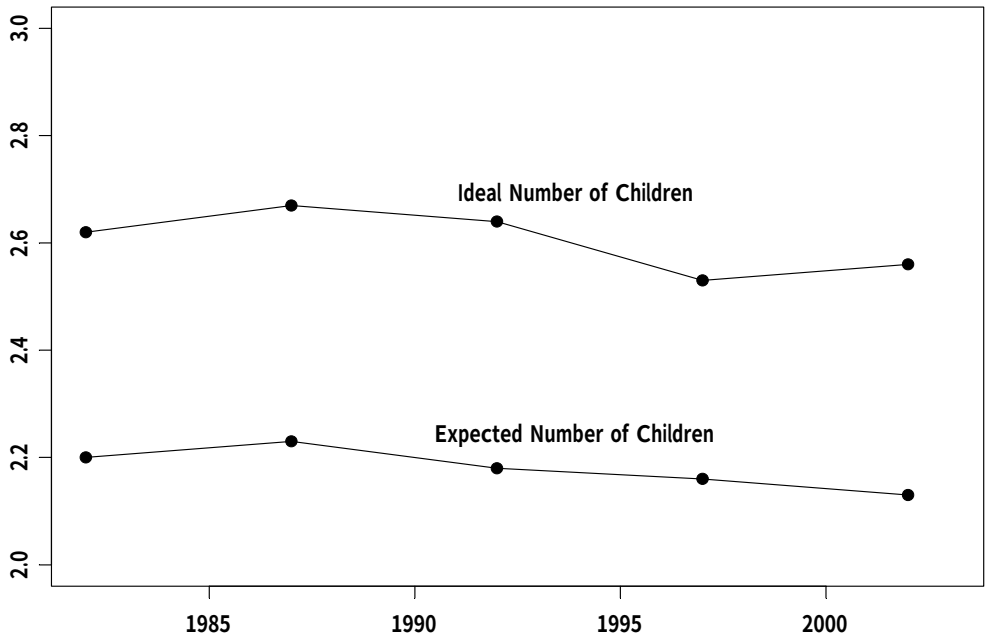
NIPSSR, Latest Demographic Statistics 2005

Figure 7. Intention of Marriage



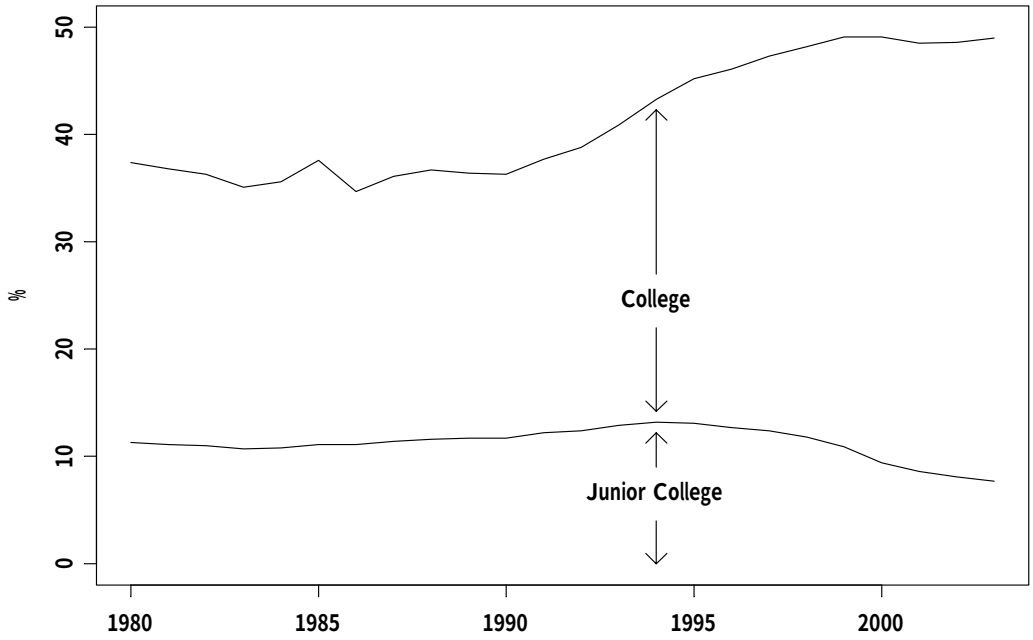
NIPSSR, National Fertility Survey

Figure 8. Demand for Children



NIPSSR, National Fertility Survey

Figure 9. Enrollments in Junior College and College



NIPSSR, Latest Demographic Statistics 2005

Figure 10. Infant Mortality Rate

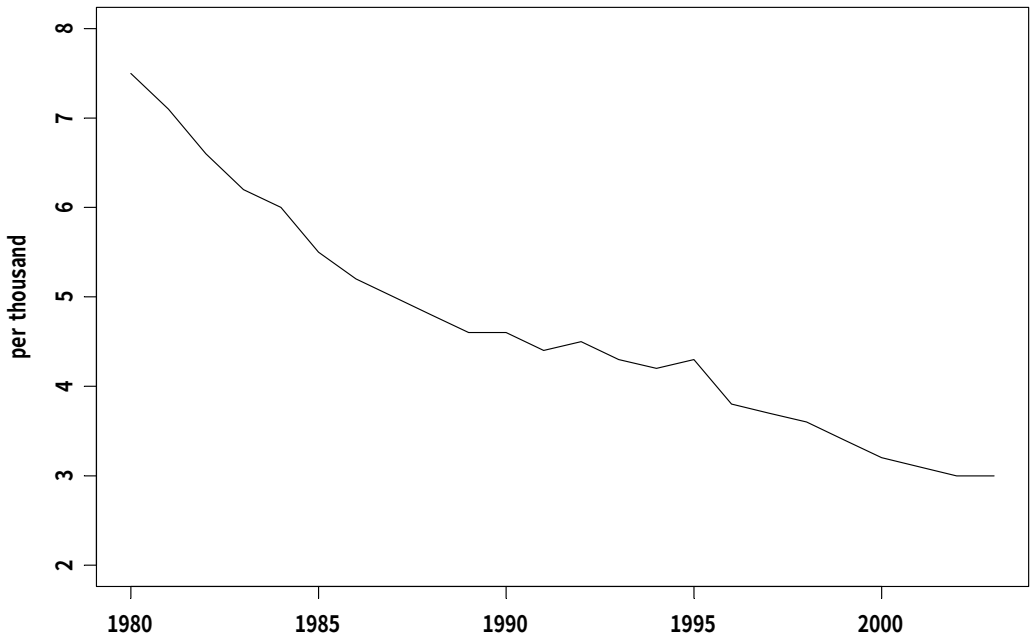
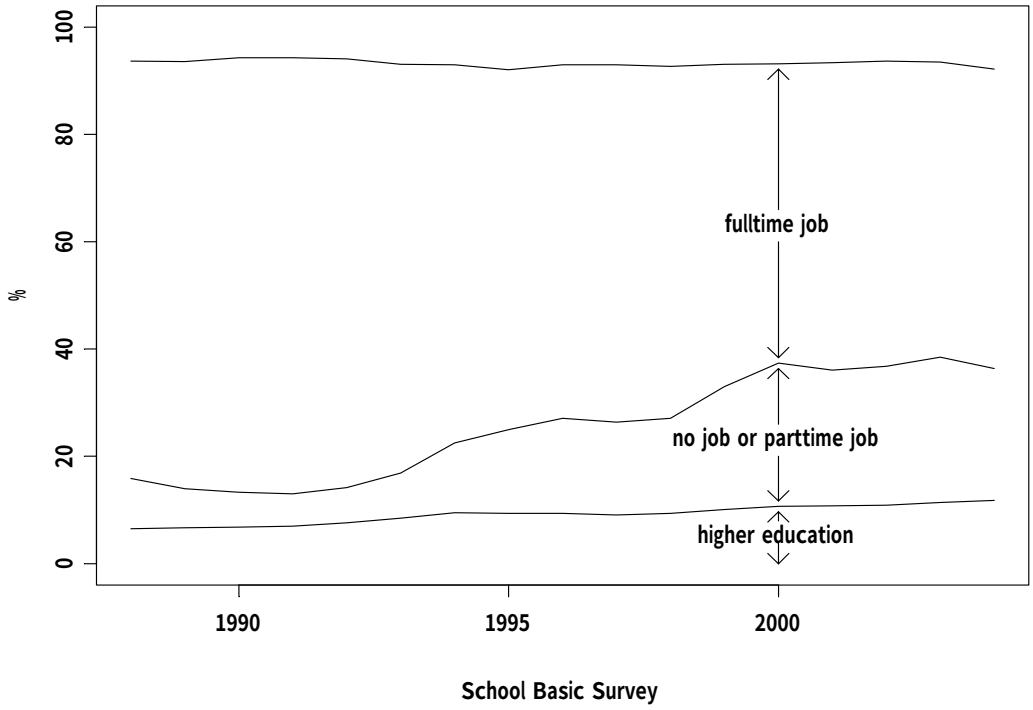
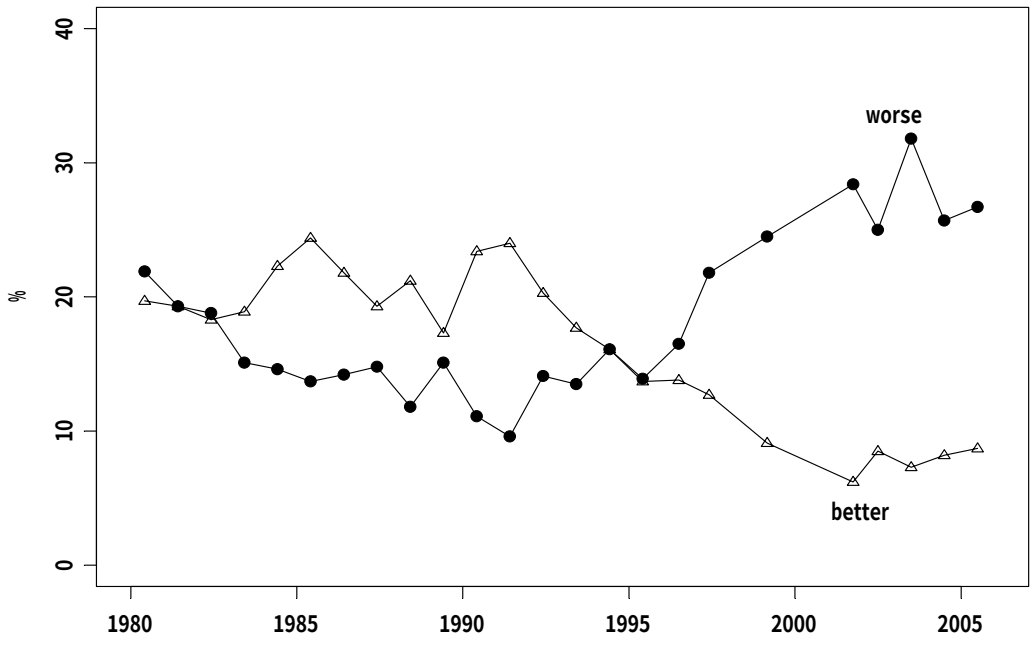


Figure 11. States of College Graduates



School Basic Survey

Figure 12. Expectation on Future's Life



Opinion Survey on People's Lives

Figure 13. Area with Negative Correlation for Different g

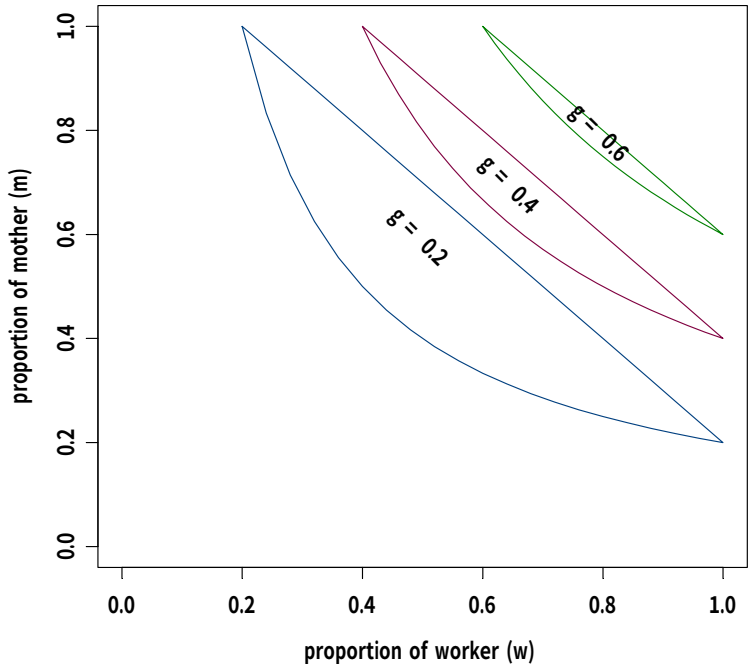
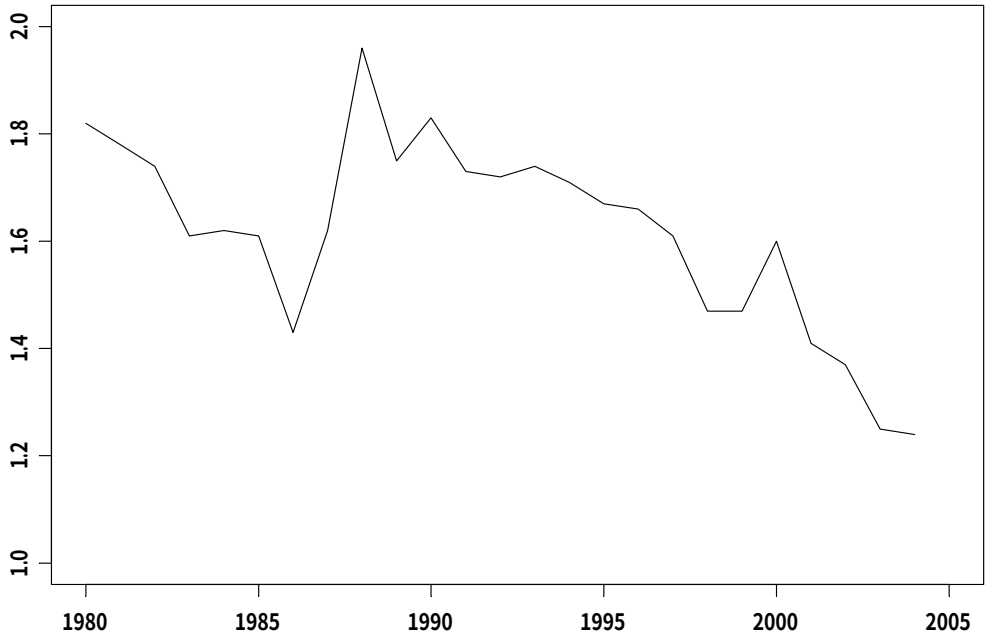


Figure 14. TFR in Singapore



Singapore Department of Statistics, Population Trend 2005

Figure 15. Median Age at Home-Leaving of Cohorts Born around 1960

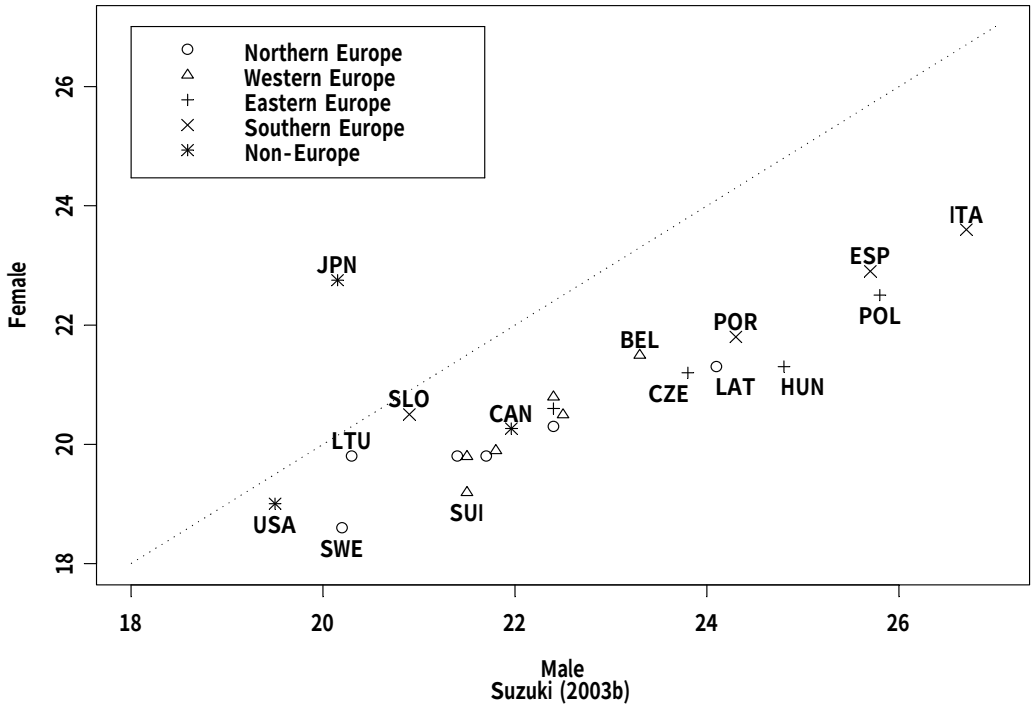


Figure 16. Proportion of Extramarital Births

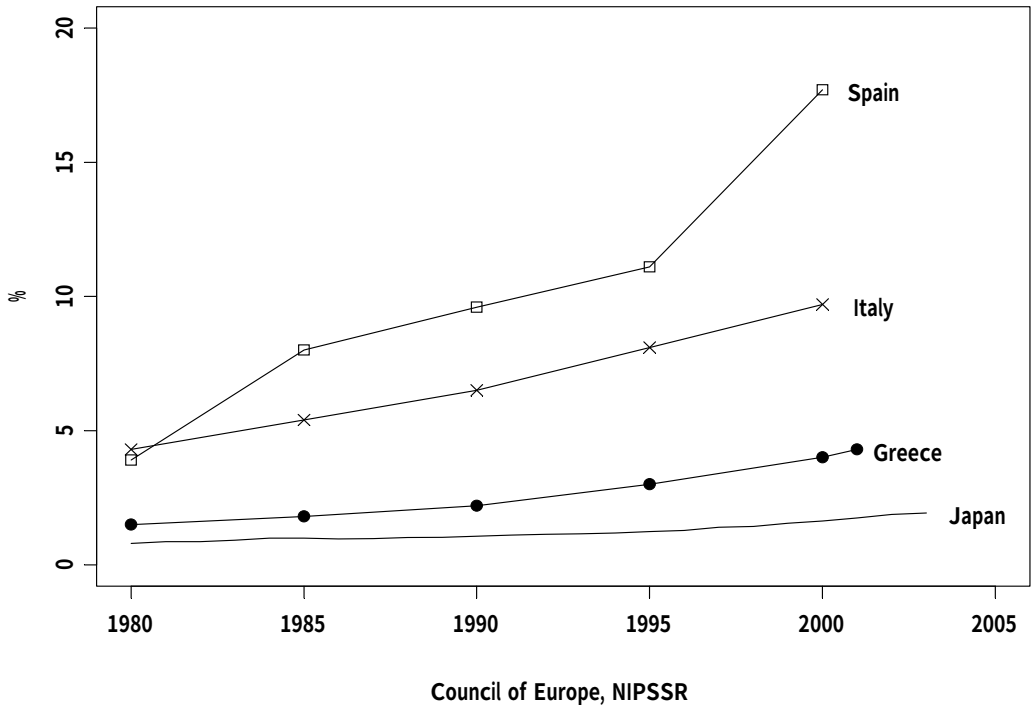


Table 1. Pro-natal Policy Interventions in Japan

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)
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)

Table 2. 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

* $\exp(b/5)$

Table 3. 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

Age 35~39 Year 1992

	Not Mother	Mother	
Not Worker	3.7	36.3	40.1
Worker	6.3	53.6	59.9
	10.0	90.0	100.0

Year 2002

	Not Mother	Mother	
Not Worker	4.9	40.3	45.3
Worker	8.0	46.7	54.7
	13.0	87.0	100.0

(Source) Employment Status Survey

Table 4. 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 5. 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