# Ⅲ　研究成果の刊行に関する一覧表

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（なし）

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# Ⅳ　研究成果の刊行物・別刷

# Lowest-Low Fertility and Its Demographic Impact in Japan[1]

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[Abstract]

Because of the expected negative population growth rate and outstanding human longevity, in the coming decades Japan will suffer from the most severe population aging in the world. While the working age population, especially that of young workers, declines rapidly, the elderly population will keep growing until 2043. According to the official projection, the proportion of the elderly will grow from 20.2% in 2005 to 39.6% in 2050. The main cause is fertility decline, which began in the mid-1970s. The total fertility rate (TFR) dropped to the "lowest-low" level, defined as 1.3 or less, between 2003 and 2005. Since the demand for spouses and children is not necessarily low, fertility decline should be attributed to growing human investments, labor market conditions, and the incompatibility between family and work. A cultural deterministic view on fertility asserts that the differences between moderately low and lowest-low (or very low) fertility are attributed to the difference between the Northern/Western European family pattern and other patriarchal patterns. Although Southern European countries are adapting to the Northern/Western European family pattern, it would be more difficult for such a change to take place in Eastern Asia. Thus, it is likely that Japan will experience a long-term population decline and must cope with various disadvantages in terms of social security, economic production and competitiveness.

## Introduction

This paper attempts a descriptive analysis of fertility decline and its demographic impact in Japan. An explanation of fertility decline and comparison with other developed countries is also attempted. Finally, policy intervention by the Japanese government is discussed.

The two sources of population aging are improvement in human longevity and decline in the population growth rate. Decline in fertility has a more direct impact on population aging than decline in mortality, because the latter effect is two-sided. Decline and aging of a population caused by fertility decline will have serious impacts on the social security system and the economic competitiveness of a country. As in other countries with low fertility,

[1] This paper was presented at the International Symposium on Aging in Spain and Japan, organized by the Spain-Japan Culture Center, University of Salamanca, between 13 and 17 October, 2008.
[2] The views expressed in this paper are those of the author and not those of the National Institute of Population and Social Security Research.

Japan's fertility decline can be explained by the delay in childbearing and decline in nuptiality, the rise in human capital investments, poor opportunities and growing uncertainty for young workers, and the low compatibility between women's work and childrearing. A comparative view reveals that such factors as gender equity, home-leaving, the mother's supreme role of childrearing, and the robustness of the marriage institution affect family patterns and can make the difference between moderately low fertility and very low or lowest-low fertility. Although the Japanese government has been making efforts to stop the decline in fertility, there is little hope for Japan to achieve moderately low fertility soon. Thus, the transition to an immigration country, sooner or later, seems to be inevitable.

## 1. Population Aging in Spain and Japan

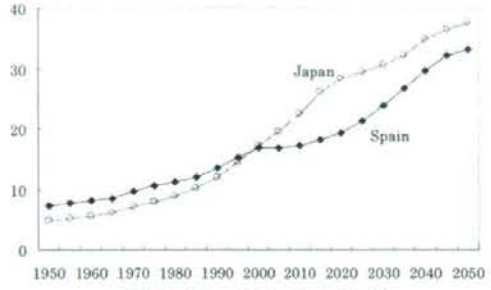
Demographically, two sources of population aging are an improvement in human longevity and a declining population growth rate (Lee, 1994). The former effect, called the "life cycle effect" or the "individual aging effect," refers to the increasing probability that an individual will live longer than before. The latter effect is called the "rate of growth effect" and refers to the impact of the growth rate on population age structure. An increasing population is young because larger weights are given to younger cohorts. Thus, a decline in the growth rate makes the population older than before.

The effect of fertility decline on age structure is quite straightforward; it always promotes population aging through the rate of growth effect. On the contrary, the effect of mortality decline is less clear. While it promotes population aging through the individual aging effect, it discourages aging because lower mortality implies a higher growth rate. Actually, the stable population theory suggests that a mortality decline that is neutral of age will not change the age structure at all. In such a case, the effect of individual aging is exactly balanced by the higher growth rate (Keyfitz and Caswell 2005, pp. 140–141). Thus, the effect of actual mortality decline depends on the age pattern of mortality improvement. It is known that when the life expectancy at birth arrives at around 65, old-age mortality starts declining faster than young–age mortality. Thus, it can be said that mortality decline promotes population aging in countries if life expectancy at birth exceeds 65. In the case of Japan, the turning point was in the 1950s. However, the main cause of population aging is fertility decline, because of its directness.

Figure 1 shows the proportion of the elderly population aged 65 and over. Until the end of the 20th century, the Japanese population was younger than the Spanish one. As shown in Figure 2, the population growth rate in Japan was basically higher than Spain until 1995, although there were some crossovers. Based on the population estimates by the UN Population Division (2006), the average annual growth rates for the period between 1950 and 2000 in Japan and Spain were 0.84% and 0.73%, respectively. As shown in Figure 3, the life expectancy at birth in Japan has been longer than in Spain since the 1970s. However, the population growth rate, rather than human longevity, determined the relative level of aging in

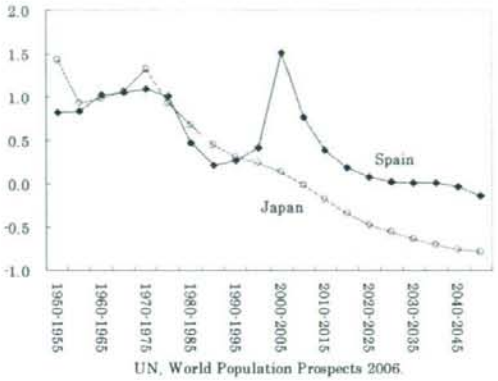
the two countries throughout the latter half of the 20th century.

Figure 1. Population Aged 65+ (%)



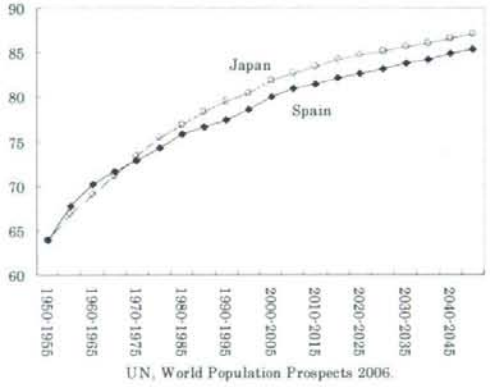

UN, World Population Prospects 2006.

Figure 2. Population Growth Rate (%)




UN, World Population Prospects 2006.

Figure 3. Life Expectancy at Birth (Both Sexes)




UN, World Population Prospects 2006.

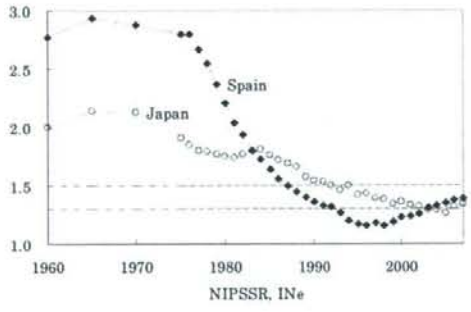
The projected trajectory of population aging in the 21st century is very different between the two countries. While population aging in Spain will slow down in the two decades following 2000, Japan's aging will accelerate. The UN Population Division (2006) projected that the proportion of the elderly population in Japan will grow from 19.7% in 2005 to 28.4% in 2020. The governmental official projection by the National Institute of Population and Social Security Research (2007) projected that the proportion will be 29.2% in 2020. Although Spain's aging will accelerate in the 2030s, the projected proportion of the elderly in 2050 by the UN Population Division is 33.2%: lower than Japan's 37.7%. The official projection for Japan by the NIPSSR is more pessimistic at 39.6% in 2050. Knowing that the projected population growth rate is lower for Japan and that life expectancy is longer in Japan, it is clear that Japan will experience a much more severe population aging than Spain.

## 2. Fertility Decline and Its Impact in Japan

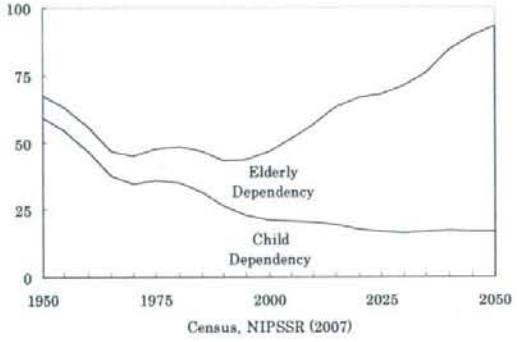
Japan's postwar baby boom lasted only for the three years between 1947 and 1949 (inclusive). The TFR dropped dramatically in the 1950s and reached 2.04 in 1957. Thus, Japan's first demographic transition took less than a decade. The TFR fluctuated in the range between 1.9 and 2.3 until 1975, with the exception of the remarkably low value of 1.54 in

1966. The second demographic transition started in 1976, but the tempo of fertility decline was much slower than in Spain, as can be seen in Figure 4. While Spain crossed the 1.5 line in 1987, Japan crossed the line in 1993. The 1.5 line was chosen by McDonald (2005; 2008) to refer to "very low fertility." There is a cultural divide shown by the fact that countries with very low fertility are Eastern European countries, Southern European countries, German-speaking Western European countries and advanced Eastern Asian countries. No Northern European country, English-speaking country or French-speaking Western European country suffers from very low fertility. In addition, the line is important because no country that has experienced very low fertility has recovered to a moderately low fertility rate of over 1.5 (Sato 2008, p. 12).

Figure 4. Total Fertility Rate




Figutre 5. Dependency Ratios in Japan

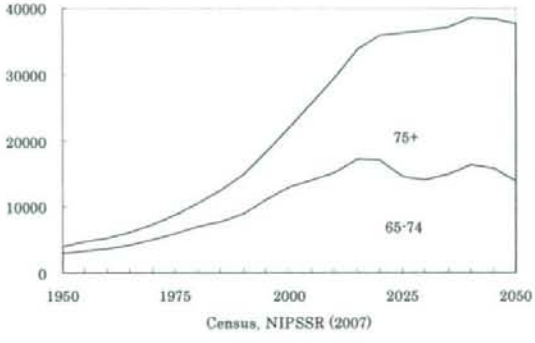



Kohler et al. (2002) chose the 1.3 line to define "lowest-low fertility." The emergence of lowest-low fertility in Europe in the 1990s surprised demographers because national fertility had not experienced such a low level, except only for a brief period. While German-speaking countries just managed to avoid lowest-low fertility, many countries in Southern Europe, Eastern Europe and the former Soviet Union experienced that low level in the 1990s. After the turn of the century, lowest-low fertility spread in advanced Eastern Asian countries, including Japan, South Korea and Taiwan. While Spain experienced lowest-low fertility between 1993 and 2002, Japan experienced it between 2003 and 2005. Although both countries escaped from the threshold of 1.3, it is not certain that either country can regain a moderately low fertility rate of 1.5 or more in the near future.

The 2005 census of Japan counted 127,768,000 inhabitants. The growth rate from 2004 to 2005 was -0.0149%. The estimated population for 2006 was 127,770,000 and that for 2007 was 127,771,000. Thus, the population growth rate since 2005 is practically zero and will turn negative soon. According to the medium variant of the official projection (NIPSSR, 2007), the population growth rate will go down to -0.5% in 2020, and -0.8% in 2033. The Japanese population will once again be 120 million in 2024; it was that size in 1984. The projected population size for 2050 is 95 million, which is about the same as the population of 1962.

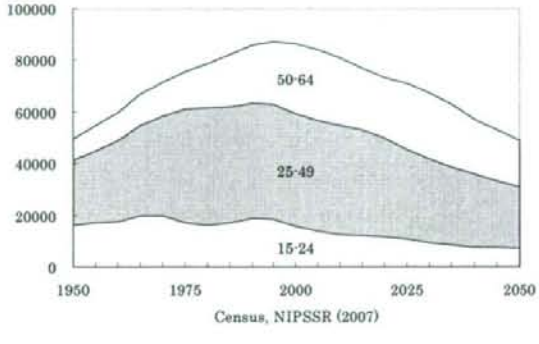
Figure 5 shows the child dependency ratio, defined as the ratio of the population under 15 to that between 15 and 64, and the elderly dependency ratio, defined as the ratio of the population over 65 to that between 15 and 64. The sum of these two ratios is the total dependency ratio. The decline in total dependency ratio due to fertility decline is called "demographic gift" or "demographic bonus" (Mason, 2001, p. 9). While Japan enjoyed this gift between 1970 and 1990, the rapid aging of the population started elevating the total dependency ratio after 1990. According to the NIPSSR (2007), the elderly dependency ratio of 30.5% in 2005 will swiftly reach 51.2% in 2025 and 76.4% in 2050. The total dependency ratio of 2050 implies that there will be 93 net consumers for 100 net producers, compared with 51 net consumers today.

Figure 6. Elderly Population in Japan




Census, NIPSSR (2007)

Figure 7. Working Age Population in Japan




Census, NIPSSR (2007)

Figure 6 displays the increase and compositional change of the elderly population. The absolute number of the elderly population will grow very rapidly until 2015 and will then slow down. The absolute number of the population over 65 will be 33.8 million in 2015, which is 31.1% larger than the 25.8 million of 2005. This implies that the population change will induce a 2.7% annual increase in public pension expenditure between 2005 and 2015. While the total population of Japan will start declining soon, the elderly population will not decline until 2043. The younger elderly group, aged between 65 and 75, will shrink after 2015 when the baby boom cohort becomes the older elderly group. The proportion of the elderly in the older group, aged 75 years and older, will grow from 45.2% in 2005 to 63.0% in 2050.

Figure 7 shows the decline and compositional change in the working age population. The medium variant predicts that the number of people between the ages of 15 and 64 will be 49.3 million in 2050, which is 41.6% smaller than the 84.4 million of 2005. This implies that, under constant capital and labor productivity, the demographic change will induce a negative economic growth of -1.2% annually, between 2005 and 2050. While the decline in the number of older workers aged 50 and older will be moderate, the number of young and

middle aged workers will decline more rapidly. Such a fall in the labor supply of skilled young workers is very problematic, under rapid technological development and globalization (McDonald, 2005, p. 1).

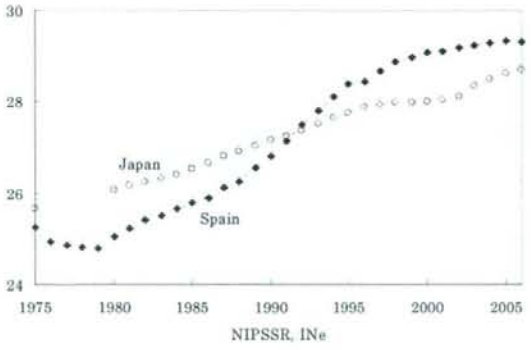
It is expected that the aging of the population will eventually boost economic growth because elderly people have more assets than younger generations, and this suggests that capital intensification will occur. However, such a "second dividend" effect would be small in Japan, because only a relatively small portion of consumption by the Japanese elderly comes from asset-based reallocations (Lee 2007, p. 31).

## 3. Causes of Fertility Decline

### 3-1. Tempo Effect

There is a secular trend of postponement of childbearing in developed countries, not all with low fertility (Billari et al. 2007, p. 149). Figure 8 compares the average age of women at first birth in Japan and Spain. The timing of first birth in Japan has been delayed, though not as rapidly as in Spain. The delay in Japan showed a sign of stagnation around 2000 and then accelerated again. Thus, it is too early to say that the age at first birth in Spain is approaching the limit. The delay in childbirth exaggerates fertility decline shown in the TFR, through "tempo distortion" (Bongaarts and Feeney, 1998). In addition, this delay causes a genuine decline through the limited time available to give births and the rising infecundity with age. Such an effect of aging in childbirth could continue both in Japan and in Spain. Goldstein (2006) deduced that the mean age at first birth can be as high as 33 years old. Considering that the figures for 2006 in Japan and Spain are 28.7 and 29.3, respectively, a little way still remains to the ceiling.

Figure 8. Mean Age of Women at First Birth



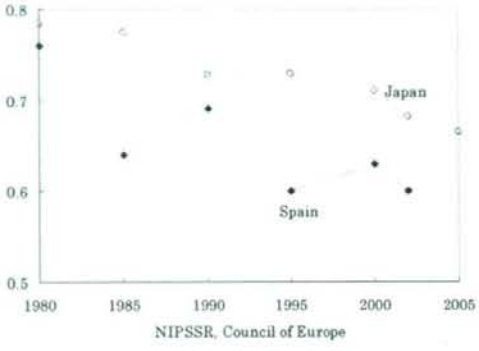

NIPSSR, INe

### 3-2. Marriage

Figure 9 shows the TFMR (Total First Marriage Rate) of women. While the TFR is the estimate of the average number of children, the TMFR is an estimate of the proportion ever married of a hypothetical female cohort without death. A large part of fertility decline can be attributed to nuptiality decline if the number of extramarital births is small. This applies to Japan, where the proportion of extramarital births was only 2.1% as of 2006. Demographic studies have shown that between 35% and 75% of fertility decline can be explained by nuptiality decline (Hirosima, 1999; 2000; Iwasawa, 2002; Ogawa, 2003; Kaneko, 2004; Suzuki, 2005). The role of nuptiality is more ambiguous in Spain where the proportion of

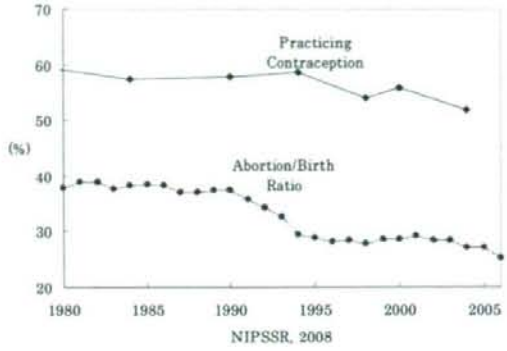
extramarital births has been rapidly increasing.

Figure 9. Total First Marriage Rate of Women




NIPSSR, Council of Europe

Figure 10. Contraception and Abortion




NIPSSR, 2008

### 3-3. Proximate Determinants

Since marriage does not explain 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 10, the proportion of currently married women practicing contraception was 52% in 2004 and was lower than in the early 1990s. The ratio of abortions to births also dropped in the early 1990s and sustained a low level under 30%. These trends do not match the assessed decline in marital fertility.

As expected, the frequency of miscarriages has been declining. There were 30,911 still births in 2006 and the ratio to live births was 2.8%. It was significantly lower than the 4.9% of 1984 and 4.4% of 1990. It is said that many mothers in Japan stop breastfeeding by 1.5 years after giving birth. Thus, neither intrauterine mortality nor postpartum amenorrhea seems to have contributed to the recent fertility decline.

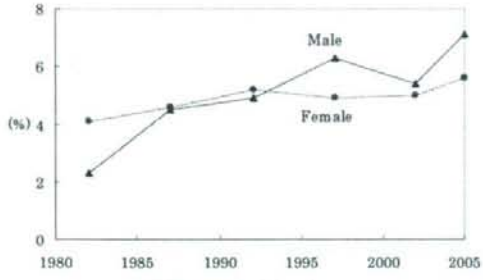
The remaining proximate determinants are frequency of intercourse and sterility. There is no time series data on coital frequency or infecundity of married couples in Japan. It might be possible to assert that sexless couples are increasing due to the long working hours or strengthened mother-child ties. 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, it is difficult to quantitatively evaluate such hypotheses, due to the lack of necessary data.

### 3-4. Demands for Spouse and Children

An important question on the recent nuptiality and fertility decline is whether it is a result of intentional behavior. 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 rejects spouses or

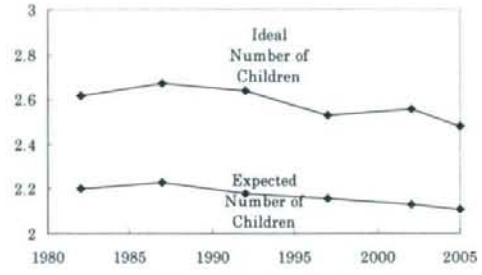
any form of partnerships. However, this is not the case in Japan. Figure 11 shows the proportion of unmarried males and females who responded to a survey with, "I will never get married." Although there is a continuous increase in the proportion of single people rejecting marriage, only 7.1% of men and 5.6% of women answered in 2005 that they will never get married. The majority of men and women still have the demand for a spouse.

Figure 11. Proportion of Unmarried without Intention of Marriage




NIPSSR, National Fertility Surveys.

Figure 12. Demand for Children




NIPSSR, National Fertility Surveys.

Figure 12 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 the question, "How many children do you think would be ideal for you and your husband?" The expected number of children is the number that the couple already has plus the answer to the question, "How many more children do you and your husband plan to have?" Although there was a slight decrease in demand for children, the figures are still higher than two. In the 2005 survey, the ideal number was 2.48 and the expected number was 2.11. Both were well above the replacement level.

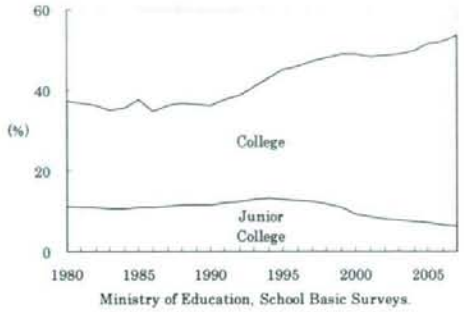
Clearly, lowest-low fertility in today's Japan is not due to lowest-low demand for spouses and children. According to Atoh (1997), the individualistic attitude has increased only moderately in Japan. Although attitudes toward gender relationships and care for elderly parents have changed considerably, these changes have not caused a decline in demand for spouses or children. Thus, the recent decline in fertility should be explained not by demand itself but by obstacles to fulfilling the demand. We will examine such obstacles in the following sections.

### 3-5. 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 for their children and educational costs have become 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 rate in Japan. For Japanese wives whose expected number of children was lower than the ideal number, the most frequent reason stated was, "Too much money is needed for childbearing and education" (NIPSSR, 2003, p.60).

Figure 13. College Enrolement




Ministry of Education, School Basic Surveys.

Figure 13 depicts the change in the college enrollment rate in Japan since 1980. Enrollment rose rapidly in the 1990s. There was some stagnation around 2000 but the rate has accelerated again recently. There has been a shift from junior colleges to colleges, implying that educational costs have been rising. 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. Therefore, Japanese parents are suffering from the financial cost of children more seriously than parents in other developed countries. In addition to financial costs, mothers whose children are in primary or secondary schools are expected to do such hard work as regularly attending school meetings, keeping up-to-date with how their children are performing, carrying out intricate tasks and supplying items for school activities (Hirao 2007, p. 174).

Human capital investments other than those concerning formal education are also increasing. For example, the Infant Mortality Rate per thousand births dropped from 4.6 in 1990 to 3.4 in 2000 and to 2.6 in 2006. The current level of less than three per thousand is among the lowest in the world. Such an achievement cannot be made freely; both the 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.

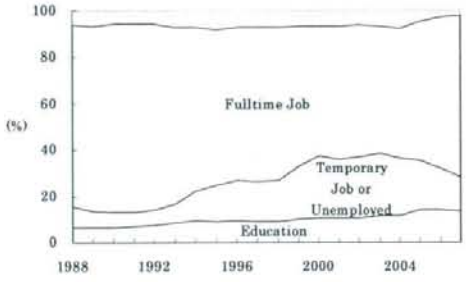
### 3-6. Economic Recession and Labor Market Condition

Young people who grow up in periods of rapid economic growth tend to have high aspirations for their future lives. When the economy slows down, however, labor market conditions for young workers become tight. Those who conceive difficulty in achieving their expected standard of living will hesitate when it comes to 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 youth career achievements. Figure 14 shows the labor force status of college graduates immediately after graduation. The proportion who had obtained a stable

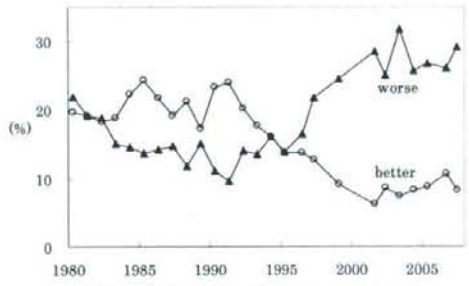
job decreased from 77.8% in 1988 to 55.0% in 2003, and then recovered to 69.2% in 2007. The proportion of those who had obtained a temporary job or who were unemployed increased from 9.4% to 27.1% between 1988 and 2003. There was some improvement, a decrease to 14.8%, in 2007.

Figure 14. States ofCollege Graduates




Ministry of Education, School Basic Surveys.

Figure 15. Expectation on Future's Life



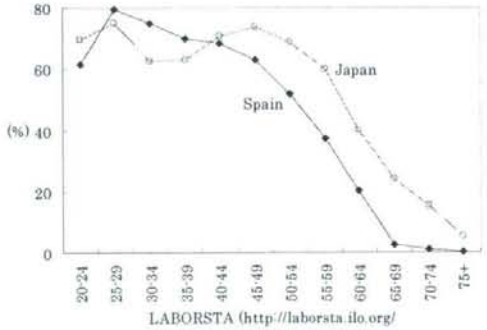

Cabinet Office, Opinion Survey on People's Lives.

The economic recession is thought to have affected people not only through employment status itself, but also through expected future income. Figure 15 shows a result of an opinion survey conducted by the Cabinet Office regarding expectations 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 July 2008, the pessimistic attitude surpassed the optimistic one by 21 percentage points. It is thought that such uncertainty about the future is one of the major sources of lowest-low fertility in recent Japan.

### 3-7. 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 has been 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 the 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.

Figure 16. Female Labor Force Participation in 2005




LABORSTA (http://laborsta.ilo.org/

The Japanese way of management until the 1980s was characterized by the lifetime employment of male workers and

the early retirement of female workers. Even today, many women quit jobs because of the incompatibility between work and childbearing. This situation is expressed in the so-called M-shaped curve of female labor force participation rates shown in Figure 16. While developed countries with moderately low fertility sustain a female labor force participation rate of around 80% until age 60, countries with very low or lowest-low fertility tend to show either an M-shaped pattern like Japan or a steadily decreasing pattern like Spain. Both patterns imply less compatibility between work and family than the "plateau" pattern. In Japan, such incompatibility is attributed to the remaining attitudes regarding gender roles, the low participation of the husband in housework, the characteristics of the labor market, and the underdevelopment of family friendly policies (Atoh and Akachi, 2003, p. 35; Meguro and Nishioka, 2000).

## 4. Lowest-Low Fertility in Comparative Perspective

### 4-1. Recent Developments in Lowest-Low Fertility

Lowest-low fertility appeared in Europe during the 1990s and caused a dramatic change in the demographic map of the region. Forerunners of fertility decline appeared by the 1980s and were characterized by developed capitalist market systems, high female labor force participation, and postmodern demographic behavior 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 a reverse in the geographic pattern of European fertility as well as a reverse in the correlation between fertility and the female labor force participation rate, the total first marriage rate, and the proportion of extramarital births (Kohler et al., 2002, pp. 643–644).

Table 1 shows the countries that have had lowest-low fertility since 2000. While Kohler and his coauthors (2002) listed 14 countries in 1999, there are 20 countries on this new list. Small countries and areas such as Singapore, Hong Kong, Luxemburg, Andorra, and San Marino were excluded. One new aspect after the turn of century was the spread of lowest-low fertility in Eastern Asia. Japan experienced lowest-low fertility between 2003 and 2005. Korea arrived at the threshold of 1.3 in 2001, followed by Taiwan in 2003. These two countries still remain in the range of lowest-low fertility.

It is encouraging that many European countries escaped from lowest-low fertility by 2006. Although recent data for Bosnia-Herzegovina and the former Soviet Union countries are not available, 8 of 11 countries for which the 2006 figures are available crossed above the 1.3 line. This group includes the top runners of lowest-low fertility in the 1990s such as Italy and Spain. In the case of Japan, the recent recovery in fertility is thought to be a result of the good economy. Many Eastern European countries and the former Soviet Union countries seem to be escaping from lowest-low fertility in the course of their transitions to market economies.

Table 1. Lowest-Low Fertility after 2000

| Region | Country | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 |
|---|---|---|---|---|---|---|---|---|---|
| Eastern Asia | Japan | 1.36 | 1.33 | 1.32 | 1.29 | 1.29 | 1.25 | 1.32 | 1.34 |
| | Republic of Korea | 1.47 | 1.30 | 1.17 | 1.19 | 1.16 | 1.05 | 1.13 | 1.26 |
| | Taiwan | 1.68 | 1.40 | 1.34 | 1.24 | 1.18 | 1.12 | 1.12 | |
| Southern Europe | Bosnia and Herzegovina | 1.28 | 1.44 | 1.23 | | | | | |
| | Greece | 1.27 | 1.25 | 1.27 | 1.28 | 1.30 | 1.33 | 1.39 | |
| | Italy | 1.24 | 1.23 | 1.26 | 1.29 | 1.33 | 1.32 | 1.35 | 1.34 |
| | Slovenia | 1.26 | 1.21 | 1.21 | 1.20 | 1.25 | 1.26 | 1.31 | |
| | Spain | 1.23 | 1.24 | 1.26 | 1.31 | 1.33 | 1.35 | 1.38 | 1.39 |
| Eastern Europe | Bulgaria | 1.30 | 1.24 | 1.21 | 1.23 | 1.29 | 1.31 | 1.37 | |
| | Czech Republic | 1.14 | 1.14 | 1.17 | 1.18 | 1.22 | 1.28 | 1.33 | |
| | Hungary | 1.32 | 1.31 | 1.30 | 1.27 | 1.28 | 1.31 | 1.34 | |
| | Poland | 1.34 | 1.29 | 1.24 | 1.22 | 1.23 | 1.24 | 1.27 | |
| | Romania | 1.31 | 1.27 | 1.26 | 1.27 | 1.29 | 1.32 | 1.31 | |
| | Slovak Republic | 1.30 | 1.20 | 1.19 | 1.20 | 1.24 | 1.25 | 1.24 | |
| Former USSR | Armenia | 1.11 | 1.02 | 1.21 | 1.35 | | | | |
| | Latvia | 1.24 | 1.21 | 1.24 | 1.29 | | | | |
| | Lithuania | 1.39 | 1.30 | 1.24 | 1.26 | | | | |
| | Moldova | 1.30 | 1.25 | 1.21 | 1.22 | | | 1.19 | |
| | Russian Federation | 1.21 | 1.25 | 1.32 | 1.32 | | | | |
| | Ukraine | 1.09 | | 1.13 | 1.17 | | | | |

(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&2004
Eurostat Homepage

However, it is too early to conclude that lowest-low fertility is only a temporary phenomenon. The classic demographic transition theory expected that fertility will fluctuate around the replacement level after fertility transition. This expectation was denied by the postwar baby boom and the secondary transition to the below-replacement level. Easterlin (1978) assumed cyclical changes of fertility in accordance to changing relative income. His prediction was partly supported in the United States where fertility recovered in the late 1990s but not in other parts of the developed world. The second demographic transition theory (van de Kaa, 1987) assumed that value changes concerning secularization and individualization are the main cause of fertility decline. However, the emergence of lowest-low fertility took place in countries with robust marriage systems and strong familism. Considering this history of failed explanations, it is unwise to attempt definitive statements on fertility change.

### 4-2. Cultural Deterministic View on Fertility

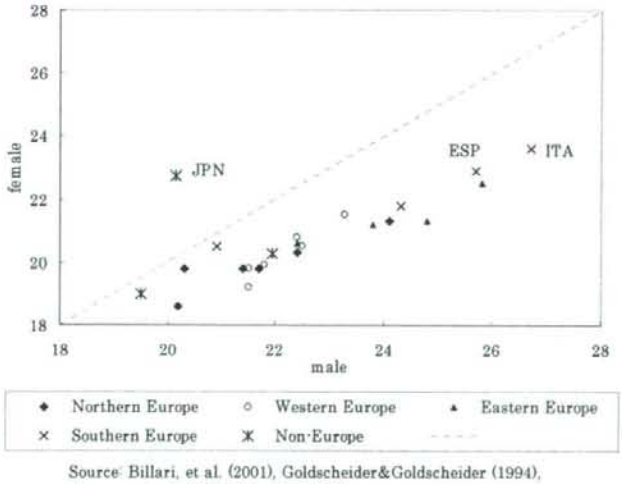
When lowest-low fertility was a phenomenon occurring only in Europe, it was natural to look for features common in lowest-low fertility countries. However, once lowest-low fertility spread out from Europe, the appropriateness of this attempt became questionable. Because lowest-low fertility has appeared 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 as requiring explanation.

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 had a higher position 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, reduced parental authority, and promoted individualism (Reher, 1998, pp. 213–214). Clearly, gender equity and compatibility between wive's work and childcare in today's countries with moderately low fertility have a long historical background. This is why these countries developed non-parental childcare activities involving baby sitters, tutors, childcare workers and other professionals. In contrast, countries with strong family ties are still clinging to maternal care. According to the Third National Family Survey in 2003 by NIPSSR, 82.9% of Japanese wives agreed that, "A mother should not work, but should take care of her child for three years after giving birth." Such an emphasis on the mother's supreme role could be the factor that curbs the effect of childcare service on fertility. According to Retherford and Ogawa (2006, p. 36), Japan's low enrollment rate of young children in day-care centers is not because of the short supply of day-care service, rather it is because of mothers' wanting to raise their children on their own.

Domestic gender equity is the key issue when it comes to very low or lowest-low fertility. McDonald (2002, p. 437) asserted that fertility falls to very low levels when gender equity rises in individual-oriented institutions, while remaining low in family-oriented institutions. Japanese husbands spend considerably shorter time on housework than US husbands (Tsuya and Bumpass, 2004) or Scandinavian husbands (Tsuya, 2003, p. 63). In the background is the problem of long working hours — governmental efforts to shorten working hours have not been successful, except in the manufacturing industry (Retherford and Ogawa, 2006, p. 37). It is

Figure 17. Median Age at Home-Leaving of Cohorts Born around 1960




Source: Billari, et al. (2001), Goldscheider&Goldscheider (1994), Ravanera et al. (1995), Suzuki (2003)

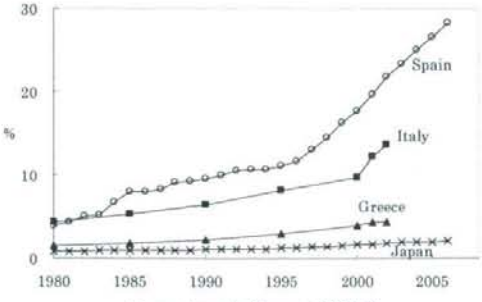
uncertain, however, whether Japanese husbands would be as cooperative as Western husbands even if working conditions were improved. For example, Italian husbands are not accustomed to housework and childcare because of the traditional gender roles in their families (Caldwell, 2006, p. 360), and this problem may also apply to husbands in Eastern Asia. Since gender equity in Northern and Western Europe has such deep roots, it would be difficult for other cultural containers to catch up with it.

Another prominent feature of Northern/Western Europe and their 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 thought to promote union formation through both consensual union and formal marriage, while Southern European adolescents are suffering from postponement syndrome, which discourages autonomy and weakens their ability to make decisions in their own lives (Dalla Zuanna, 2001; Livi-Bacci, 2001). As shown in Figure 17, 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 births was observed. These forms of postmodern behavior were once related to a decline in fertility to below the replacement level. Today, however, the low frequency of such behavior is a good predictor of lowest-low fertility. Japan is characterized by a very robust marriage institution. As shown in Figure 18, the proportion of extramarital births in Japan has been extremely low, even in comparison with Southern European countries. The proportion in 2006 was 2.11%, which barely changed from 0.80% in 1980. On the other hand, Southern European countries, including Spain, are now experiencing the delayed second demographic transition, namely the spread of post modern phenomena, such as cohabitation, extramarital births and marital instability (Billari 2008, pp. 9–11).

The explanation based on the family pattern suggests that very low or lowest-low fertility will keep spreading around the world. When a society arrives at a certain level of economic development, social forces such as increasing human investments, occupational insecurity and female labor force participation will severely depress fertility. Because no other societies have family patterns as unique as Northern/Western Europe's, their fertility rates will go down to the

Figure 18. Proportion of Extramarital Birth




Source: Council of Europe, NIPSSR

extremely low level. This may happen soon in Southeastern Asia, Latin America, or the coastal region of China.

### 4-3. Correlation between Female Labor Force Participation and Fertility

As mentioned above, the relationship between female labor force participation and fertility turned from negative to positive in the mid 1980s (Engelhardt and Prskawetz, 2005, pp. 2–3; Billari and Kohler, 2002, pp. 20–21; Atoh, 2000, p. 202). However, there is a paradox in that micro data analyses in Japan keep showing a negative impact of female labor force participation on fertility (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). This paradox can be understood with a very simple model. Let g be the proportion of working mothers, m be that of all mothers, and w be that of all working wives. Then, a two by two contingency table for married women of a specific age group 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 $0 < g < w$.

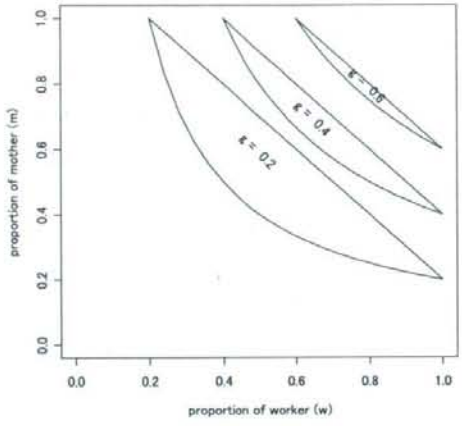
$$1 - w - m + g > 0.$$

For the work status 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 the two conditions above. Figure 19 shows such areas for g = 0.2, 0.4 and 0.6. If we consider g to be a measure of compatibility, the area moves in the upper-right direction as the compatibility is improved. Thus, the paradoxical situation can be understood as a result of an increasing compatibility. When women's work and childrearing were 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 the macro level while the negative correlation is sustained at the micro level.

Figure 19. Area with Negative Correlation for Different g




One implication of Figure 19 is that the higher the compatibility, the narrower the area in which the micro-macro paradox holds. Thus, it is expected that a country with high compatibility may easily escape from the area and the micro level correlation may turn to be positive. This expectation is materialized in Sweden where recent micro level analyses showed the positive impact of women's employment on fertility (Hoorens, et al., 2005, pp. 226–227). However, Figure 19 suggests that in a country with low compatibility such as Japan, there is a wide space for fertility decline.

Table 2. Labor Force Participation and Motherhood of Married Women Aged 30-34 (%)

| 1997 | Not Mother | Mother | |
|---|---|---|---|
| Not Worker | 9.6 | 47.1 | 56.7 |
| Worker | 11.9 | 31.4 | 43.3 |
| | 21.6 | 78.4 | 100.0 |

| 2004 | Not Mother | Mother | |
|---|---|---|---|
| Not Worker | 8.2 | 48.7 | 56.9 |
| Worker | 12.9 | 30.2 | 43.1 |
| | 21.2 | 78.8 | 100.0 |

| 2007 | Not Mother | Mother | |
|---|---|---|---|
| Not Worker | 7.5 | 43.0 | 50.5 |
| Worker | 15.7 | 33.8 | 49.5 |
| | 23.1 | 76.9 | 100.0 |

Ministry of Internal Affairs and Communications, Employment Status Survey.

In Japan, however, the governmental efforts have not been successful in raising fertility through the improved compatibility. Table 2 shows contingency tables of work status and the presence of a child of married women aged 30–34. This age group is the bottom of the M-shaped labor force participation pattern, implying that compatibility is most crucial. The proportion of working mothers (g) decreased slightly from 31.4% in 1997 to 30.2% in 2004, while labor force participation (w) and fertility (m) showed no significant changes. Although there was an increase in the proportion of working mothers from 30.2% in 2004 to 33.8% in 2007, this has not resulted in an increase in the proportion of mothers. While a shift from working non-mothers to working mothers was expected, what happened was a

decrease in fulltime housewives and a simultaneous increase in working wives regardless of whether children exist or not.

There are two strategies to achieve the compatibility (Rosenbluth 2007, pp. 16–19). English speaking countries such as the United States are characterized by high labor mobility. Because male workers are as likely to quit as female workers, employers have no reason to avoid employing women. The opportunity cost of having a child is lessened through market forces, especially by the provision of cheap labor by illegal immigrants. In Northern European countries, a huge number of women are employed as governmental workers. These countries have well developed family policy measures such as child allowances, parental leave and public childcare services. Countries with very low or lowest-low fertility have neither the U.S strategy nor the Northern European strategy. Japan's neo-liberalistic political orientation sustains a low tax rate and limits the budget for family policy. Thus, it is impossible to achieve the family welfare system that Northern Europe or France operates. While on the other hand, the childcare service market does not develop because of the cultural pattern of strong familism and the distrust of non-public childcare services.

## 5. Policy Intervention in Japan

### 5-1. Governmental Intervention since 1990

The Japanese government was surprised by the historically low TFR of 1.57 in 1989 and started an inter-ministry committee to create measures to cope with the declining fertility in 1990. The amount of the child allowance was raised in 1991, while the period of payment was shortened to keep to 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 period between 1994 and 1999. The program emphasized the compatibility between work and childcare and public support for childrearing. As a part of this program, amendments to the Childcare Leave Law were made to support income and exempt social security premium payment in 1994. In 1997, a major reformation was made to the Child Welfare Law to provide working mothers with satisfactory daycare services.

In December 1999, the government released 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, an amendment to the Childcare Leave Law determined that 40% of wages should be paid during the leave. The child allowance, which was previously available only for children less than three years old, was expanded to also cover preschoolers. The cabinet adopted the "Zero Waiting List for Daycare Program" as a political goal in July 2001. As a result, the daycare center enrollment rate of children under age two increased from 15.6% in 2001 to 20.3% in 2007. At least a part of the difference from Northern European countries, where the rate is higher than 40%, should be attributed to the cultural pattern that