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Low Fertility and Population Aging:

Socioeconomic Impacts of Baby Bust

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KOREA INSTITUTE FOR HEALTH AND SOCIAL AFFAIRS

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CONTENTS

The Socioeconomic Implications of Baby Bust in Korea

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Ⅰ. BABY-BUST IN KOREA

Since Korea was divided into two parts, South Korea (Republic of Korea) and North Korea(People's Democratic Republic of Korea) immediately after the liberation of the Korean peninsula, the demographic change in South Korea(hereafter Korea means only South Korea) needs to consider that after 1945. Although many people returned from oversea countries such as China(including Manchuria) and USA who fought against Japanese colonial ruling, the number of babies was from around 300 thousands to 400 thousands due to domestic turmoil.

The number of babies rapidly increased to around 700 thousands, after the Korean government was established in 1948. However, such a level of babies could not jump until the end of Korean War (1950~1953). After the Korean War, the number of babies rapidly increased to 820 thousand in 1954, 980 thousand in 1955, and more than 1 million during the 1956-1971 period. The first baby-boom generations, born from 1955 to 1963, accounted for 14.6% (or 7.12 million) and the second baby-boom generations, born from 1964 to 1974, accounted for 14.6% (or 6.04 million) as of 2010.

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The number of babies started decreasing after its peak of 1.12 million in 1963 due to the strong family planning by government which was launched in 1962. Thereafter, the number of babies continued to decrease to around 900 thousand during the period of 1972-1974, to around 800 thousand during the period of 1975-1983, and to around 700 thousand during the period of 1984-2000 despite of halting the free supply of contraception and abolishing the anti-natal policy in 1996. The number of babies decreased further to around 550 thousand in 2001 after the economic recession in 1997. From 2002 to 2010, The number of babies have been at around 400 thousand sixth severe irregularities, although the pro-natal policy, called "the Basic Plan for Low Fertility and Population Ageing", have been launched since 2006.

Figure 1. Trends in Number of Babies, 1955-1974

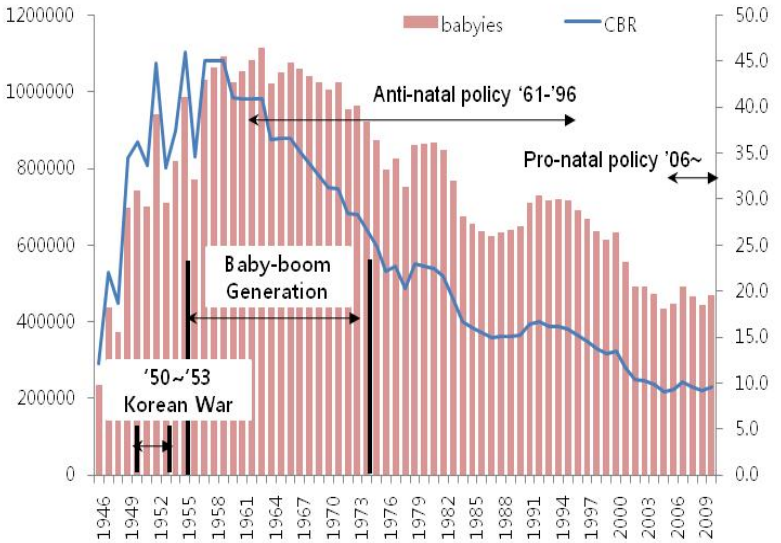
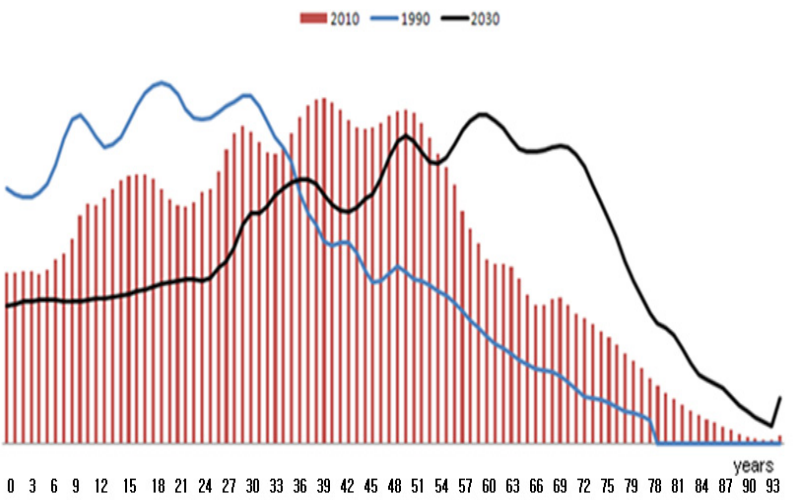


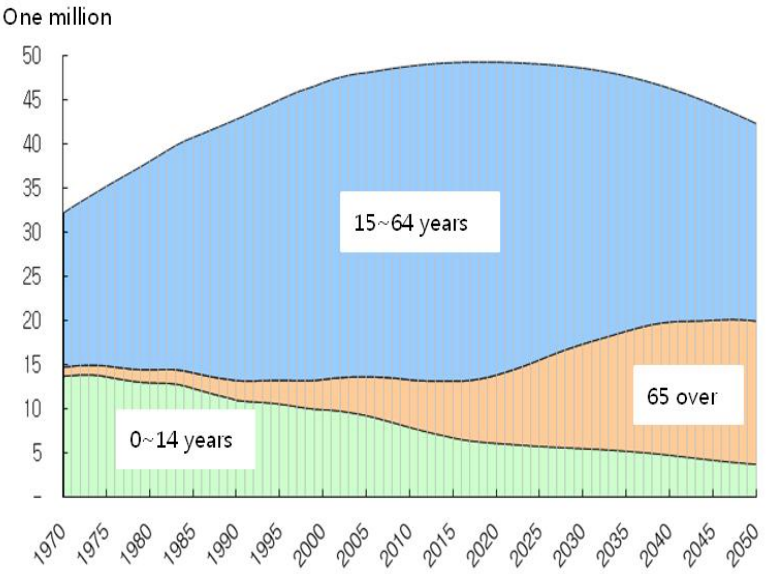
Figure 2. Change of Population Structure



Ⅱ. DEMOGRAPHIC IMPLICATIONS

As the number of births has rapidly decreased during last 50 years, the size of childbearing population has shrunk and will shrink rapidly. It means that although the fertility rate increase in the future, the number of births will not increase at least to the level before the second rapid fertility decline. Assuming that the total fertility rate (TFR) increase from 1.08 in 2005 to 1.28 in 2030 and thereafter such a level continues, the population size will start declining after a peak of 49.3 million in 2018 and shrink to 42.3 million in 2050, according to the 2006 projection by KNSO(2006).

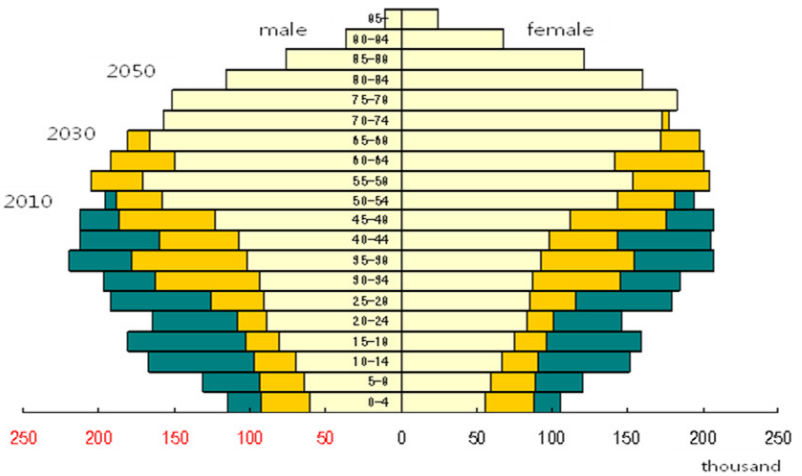
Figure 3. Future Change in Population Size, 1970-2050



Source: Korea National Statistical Office, Future Population Projection, 2006.

If we break the whole population into broad age groups, the youth aged 0 to 14 and working-age population aged 15 to 64 will rapidly decrease, leading to a shrinking of the total population. The youth will decrease from 7.91 million in 2010 to 3.76 million in 2050. The working-age population from 15 to 64 year will also decrease to 22.42 million in 2050 after a peak of 36.19 mil in 2016. However, the size of the aged population, 65 years or older, will rapidly increase as the baby-boomers become 65 year or older from 2020. The elderly will increase to 11.81 mil in 2030 and 16.16 mil in 2050, doubling and tripling its size of 5.36 mil in 2010. Thus, the population structure of Korea will quickly transfer from a bell-type to a coffin-type.

Figure 4. Change in Population Structure, 2010, 2030, 2050

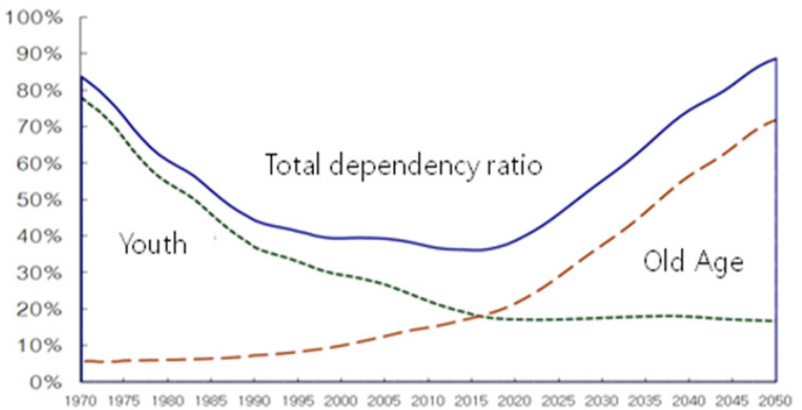


Source: Korea National Statistical Office, Future Population Projection, 2006.

Accordingly, the proportion of the elderly to the total population will rise from 11% in 2010 to 24.3% in 2030 and then 38.2% in 2050. Indeed, as the baby-boomers start entering the elderly group from 2020, the population will become quickly aging. Only 18 years will be needed to double the proportion of the elderly from 7%(aging society) in 2000 to 14% (aged society) in 2018; thereafter only 8 years will be needed for the proportion of the elderly to reach 20% (super aged society). The duration needed for the transfer from the aging society to the aged society is estimated to be 115 years for France, 61 years for Italy, 40 years for Germany, 72 years for USA, 24 years for Japan; that for the transfer from the aged society to the super aged society is estimated to be 40 years for France, 20 years for Italy, 38 years for Germany, 16 years for USA, 12 years for Japan (KNSO, 2005). The population aging with decline of the working aged population will increase the old age dependency ratio from 15.0 to 37.7 in 2030 and 72.0 in 2050; on the other hand, the potential supportive ratio will decrease fro, 6.6 to 2.6 in 2030 and 1.4 in 2050. The youth dependency ratio will decrease further to 17.7 in 2030 and 16.8 in 2050.

With the old age dependency ratio and the youth dependency ratio moving in the opposite directions, the total dependency ratio will reach the lowest point of 36.5% in 2016, when the old dependency ratio start surpassing the youth dependency ratio. Indeed, Korea will have experience the period of "population bonus" during 2010-2020.

Figure 5. Change in Dependency Ratio in Korea, 1970-2050



Source: Korea National Statistical Office, Future Population Projection, 2006.

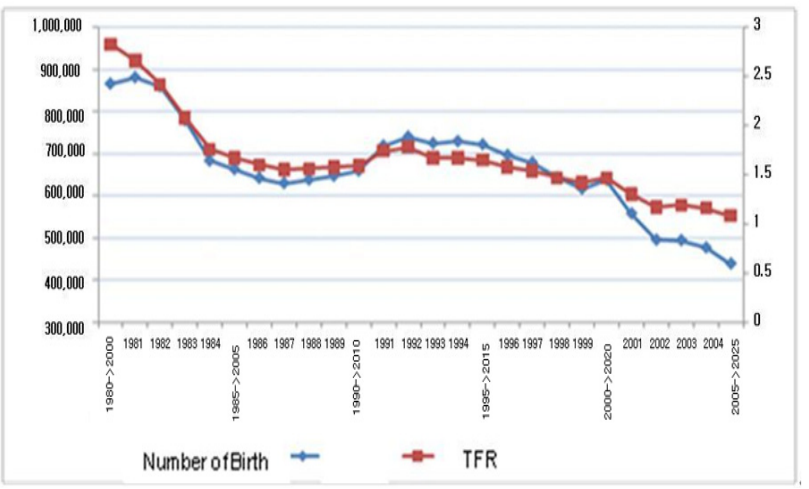
Ⅲ. ECONOMICAL IMPLICATIONS

Baby-bust and Labor Market

As the number of baby has decreased with some irregularities since 1971 when it was peaked at about 1.05 million of live births, the size of working-age population will decrease after a peak of 36.19 million in 2016 and the core working-age population, 25 to 49 years old, started decreasing after 2007. Accordingly, the number of the employed is estimated to decrease from 23.50 million in 2008 to 24.80 million in 2019 and about 17 million in 2050.

The growth rate of the total employed is estimated at 0.97% during 2000s, -0.60% during 2020s, -1.31% during 2030s, and -1.65% during 2040s (Moon et.al., 2004). It is worthwhile to note that along with decline of TFR to 1.6 after mid-1980s, the labor force size started diminishing from 2000 with a time-lag of 20 years; the impact of lowest low fertility level in 2000s will appear in earnest from 2020. The first baby-boomers of 7.12 million among which 5.32 million was working, have started retiring in earnest from 2010 and thereafter 3.11 million salaried workers will retire within 8 years, whereas the new working-age population will be only 0.55 million during 2010 and 2018. As a result, the labor shortage will be aggravated, as estimated to 0.63 million in 2015 and 1.52 million in 2020 (Bang et. al., 2004).

Figure 6. Prospects of Labor Force Decline after 20 Years due to Fertility Change

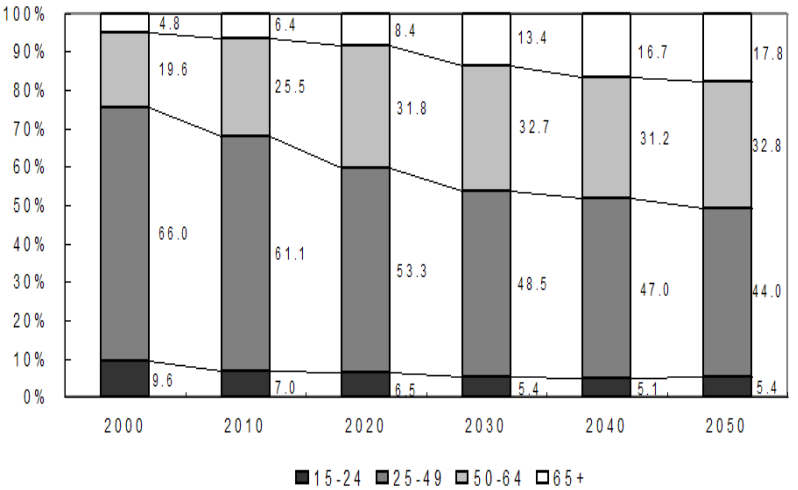


Source:KNSO. KOSIS.

Since the generations born in the mid-1980s and 1990s, shrunk due to low fertility, will have newly entered the labor market and the baby-boomers will stay in the labor market for the time being, the ageing of labor force will be accelerated.

The population aged from 55 to 64 to the whole working-age population will increase from 12.2% in 2000 to 23.3% (one quarter) in 2020, 28.9% (one third) in 2040. Accordingly, the average age of working-age population will increase from 39.7 years old in 2010 to 44.1 years old in 2040. The proportion of the workers 50 years old or higher accounted for less than 25% in 2000, but it is estimated to be more than 50% in 2050; on the other hand, the proportion of workers aged from 25 to 49 will decrease from 66% to 44% during the same period.

Figure 7. Prospects of Labor Force by Age Group, 2000-2050



Source : Korea National Statistical Office . Economically Active Population Survey. each year. OECD (2002). population projections 2000-2050

In reality, it has been concerned that the accelerated ageing of labor force in major industrial areas such as steel iron, ship-building, auto-mobiles, etc., would threat to rise in wages and fall of industrial competition (KCCI, 2005). The average age of workers was early or mid 30s in the early 1990s but recently it is mostly the late 30s with some industries at average age of 40s (Ministry of Employment and Labor).

As of 2009, the average age of workers was 45.3 year for "Manufacture of Coke, hard-coal and lignite fuel briquettes and Refined Petroleum Products", 41.5 years for "Manufacture of Pulp, Paper and Paper Products", 41.4 years for "Manufacture of Textiles, Except Apparel", 40.5 years for "Tanning and Dressing of Leather , Manufacture of Luggage and Footwear", and 40.2 years for "Manufacture of Basic Metal Products". It increased by 10.7 years for "Manufacture of Coke, hard-coal and lignite fuel briquettes and Refined Petroleum Products", by 8.7 years for "Manufacture of Textiles, Except Apparel", and 7.2 years for "Manufacture of wearing apparel and Fur Articles" during the period from 1993 to 2009. The ageing of labor force is expected to decrease labor productivity, increase rate of which will decrease from 1.8% in 2000s to 1.1% in 2040s (Moon, et, al., 2004). After controlling human capitals and material capitals, increase of 1% point in the proportion of workers 55 years old or higher is estimated to decrease labor productivity by 0.09~0.17%.

Table 1. Mean Age of Laborers by Industry, 1993-2009

	1993	1995	2000	2005	2007	2009
Manufacture of Textiles, Except Apparel	32.7	33.8	36.8	39.5	40.2	41.4
Manufacture of wearing apparel and Fur Articles	32.1	33.3	37.7	38.3	38.6	39.3
Tanning and Dressing of Leather, Manufacture of Luggage and Footwear	36.0	37.6	39.2	40.0	41.5	40.5
Manufacture of Pulp, Paper and Paper Products	35.5	36.7	37.8	39.6	40.4	41.5
Manufacture of Coke, hard-coal and lignite fuel briquettes and Refined Petroleum Products	34.6	34.1	35.8	37.8	40.0	45.3
Manufacture of chemicals and chemical products	32.9	34.5	35.4	36.4	37.3	38.4
Manufacture of Rubber and Plastic Products	33.0	35.2	37.2	37.9	37.0	39.3
Manufacture of Basic Metal Products	36.7	37.8	37.6	40.2	39.9	40.2

Table 1. (Continued)

	1993	1995	2000	2005	2007	2009
Manufacture of Other Machinery and Equipment	33.3	34.0	35.5	36.9	36.5	38.0
Manufacture of Medical, Precision and Optical Instruments, Watches and Clocks	31.9	31.1	33.5	34.6	35.7	35.4
Manufacture of Motor Vehicles, Trailers and Semitrailers	33.1	33.5	34.7	36.6	37.6	38.7
Manufacture of Other Transport Equipment	35.9	36.6	38.8	39.3	40.4	37.6
Manufacture of Office Machinery and Equipment	30.1	28.8	31.1	32.5	34.8	-
Manufacture of Electronic Video and Audio Equipment	28.8	29.4	31.2	32.1	32.2	32.7
Accommodation and food service activities	32.4	32.8	36.3	35.5	37.2	37.5
Financial and insurance activities	29.9	30.8	31.0	35.2	35.0	36.7
Computer programming, consultancy and related activities	31.7	31.4	30.7	32.1	32.5	33.7
Research and Development	34.1	35.2	36.1	36.0	35.8	36.0
Arts, sports and recreation related services	35.6	35.6	34.8	36.2	36.6	37.5

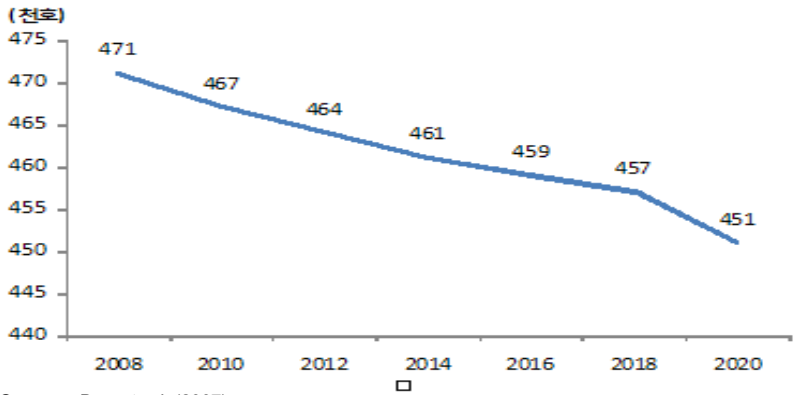
Source : Ministry of Employment and Labor. Survey on Labor Conditions by Type of Employment. Each year

Baby-bust and Demands on Domestic Market and Job

The diminishing of babies is expected to shrink the demands on domestic market such as demands on goods and services for children in the medium and long term. The retirement of babyboom generations will also decrease the demands on housing, education, and other goods and services, since the level of consumption by the people aged 60 and older is only 65% of the consumption of those aged 40s and 70% of the consumption of those aged 50s(KNSO, 2009). For example, the amount of houses to be constructed is estimated to decrease from 471 thousand housing units in 2008 to 451 thousand housing units in 2020, due to shrinking of demands on housing (Bae et. al., 2007).

Figure 8. Demands on Housing(2008~2020)

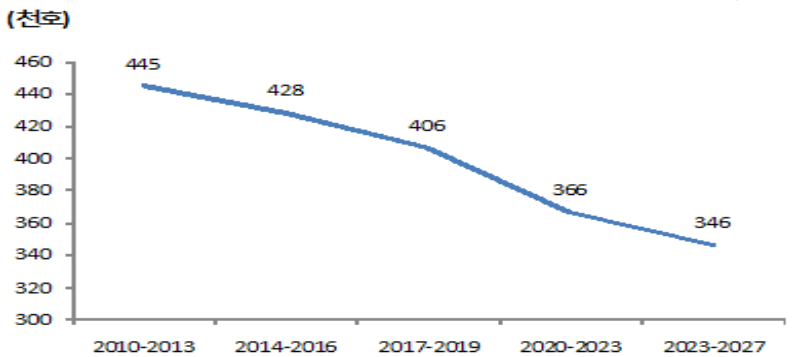
(unit: 1,000 housing units)



Source : Bae et. al.,(2007)

Figure 9. Prospects for Housing Construction

(unit: 1,000 housing units)

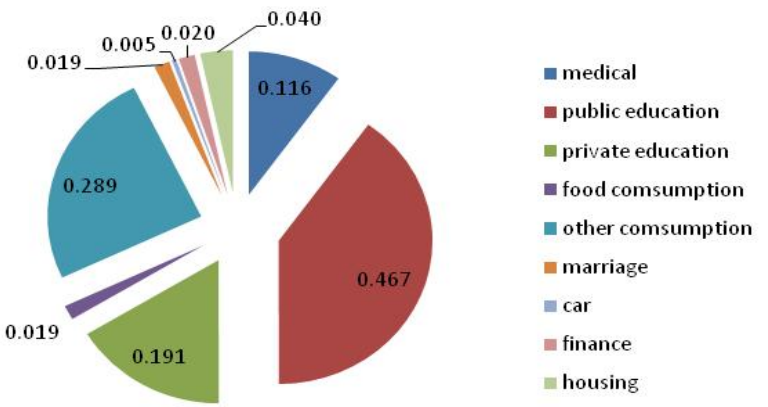


Source : Bae et. al.,(2007)

Shrinking of demands on domestic market will be rendered to decrease in jobs, imbalance in industries, and economic recession. Since 1.15 jobs per baby is estimated to decrease through its lifetime, 142 thousand jobs will be lost if TFR last at 1.25 in comparison with TFR of 1.60 (Kim & Woo, 2009). As an evidence, the number of obstetrics and gynecology hospitals or clinics decreased by 8.5%, and the number of pediatric hospitals by 7.8% during the period from 2003 to 2007 (Korea Medical Association, 2008).

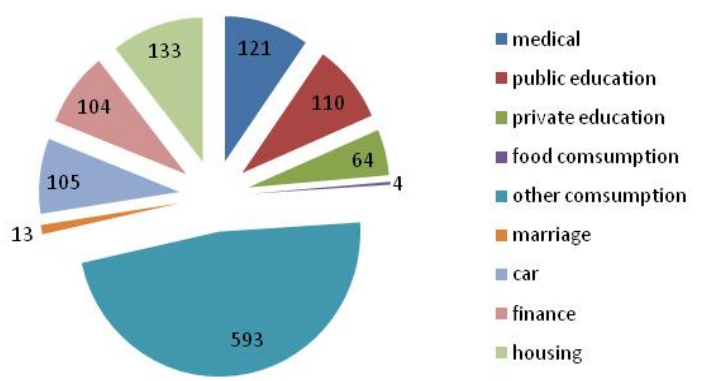
Since 1,225 million won (approximately 1,125,402 USD) of industrial production per baby is created through its lifetime, 150 trillion won of industrial production will be lost if TFR continues at 1.25 rather than at 1.60 (Kim & Woo, 2009).

Figure 10. Employment Effect (Jobs) per Baby through Lifetime



Source: Kim H.S., S.J.Woo., (2009). Economic Effect of Fertility on Job Creation and Production. Ministry of Health and Welfare.

Figure 11. Industrial Productivity Effect (output) per Baby through Lifetime

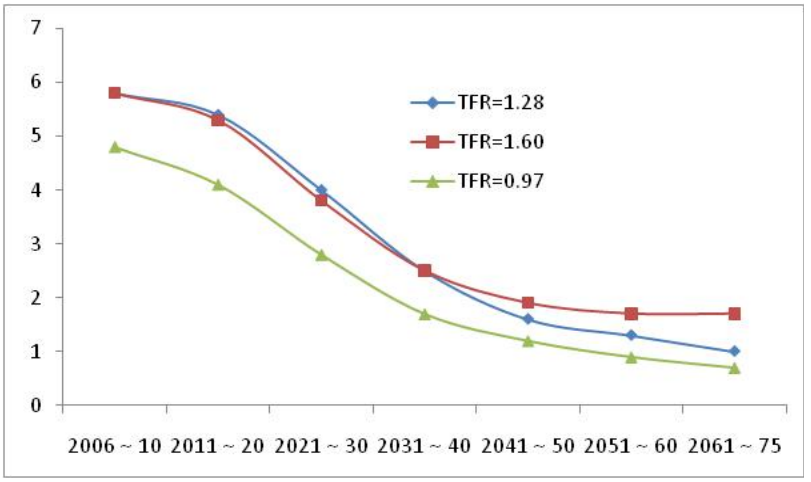


Source: Kim H.S., S.J.Woo., (2009). Economic Effect of Fertility on Job Creation and Production. Ministry of Health and Welfare.

Baby-bust and Economic Growth

Real GDP growth rate will slow down from 5.8% per annum in 2006-2010 to 1.6% in 2041-2050 and to 1.0% in 2061-2075 (Han, et. al., 2007). The economic growth rate will be acceleratedly slowed down from 2020 when the baby-boomers start entering in earnest the elderly group, which will induce the decreasing trend in the increase rate of the employed, the rapid increase in the old dependency ratio, etc.

Figure 12. Projections for Real GDP Growth Rate by Scenario of Fertility, 2006-2075



Note: TFR=1.28 denotes that TFR will increase from 1.08 in 2005 to 1.28 in 2030 and thereafter such a level will continue.

TFR=1.60 denotes that TFR will increase from 1.08 in 2005 to 1.60 in 2030 and thereafter such a level will continue.

TFR=0.97 denotes that TFR will decrease from 1.08 in 2005 to 0.97 in 2030 and thereafter such a level will continue.

Source: Han, J.H., K.S.Choi., S.H.Shin., K.M.Lim., J.I.Kim., (2004). Long-term Projection of Macro Economic Variables of the Aging Society : 2006-2080., Korea Development Institute.

Ⅳ. SOCIAL IMPLICATIONS

Baby-bust and Pension

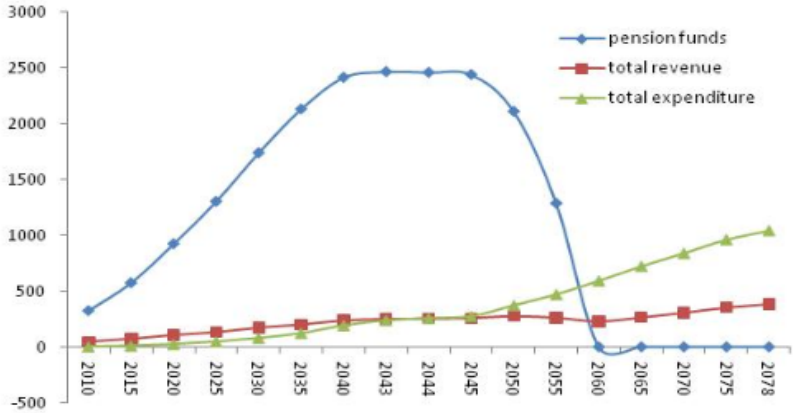
Along with reduction in babies after its peak in the early 1970s, the number of contributors to national pension will decrease to 7.50 million in 2078 after its peak of 18.90 million in 2014, whereas the number of pensioners will decrease 1.89 million in 2008 to the peak of 11.12 millions in 2059. In 2055, the number of pensioners will start surpassing the number of contributors; the ratio of pensioners to contributors will rise from 10.3% in 2008 to 101.1% in 2055 and 119.7% in 2065. The pension deficit, earnings less than expenditure, per annum will occur from 2044 and the fund will be exhausted in 2060 after its peak of 2,465 trillion wons in 2043. The earnings of pension in 2060 will account for only 39% of the total expenditures. Thus, the premium rate will need to increase from the current rate of 9% to 12.5%~17.5%.

Baby-Bust and Health Insurance

As the baby-boomers retire in earnest from 2010 and enter the elderly group from 2020, and the number of babies has rapidly decreased since the early 1970s, the gap between the number of medical insurance holders and the number of people to be covered for beneficiary has increased in every year; the difference by subtracting medical insurance holders from those to get benefits will increase for 8.72 million in 2011 to 10.71 million in 2030. The decrease rate of medical insurance holders is estimated to be -14.77% during the period between 2011 and 2030, which is rather faster than the decrease rate of those to get beneficiary, -1.19%.

Figure 13. Projection for Pension Funds, 2010-2078

(unit : billion K, %)

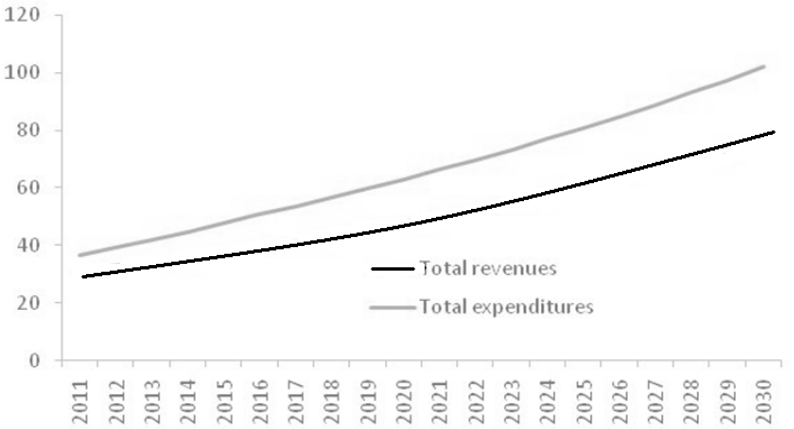


Note: Assuming that TFR will increase from 1.08 in 2005 to 1.28 in 2030 and thereafter such a level will continue.

Source: National Pension Finance Estimate Committee (2008). Long-term Projection for Nation Pension Finance and Future Direction.

It is worthwhile to note that the medical expenditure for the elderly is estimated to surpass that for the people aged under 65 in 2019 (Graduate School of Public Health Seoul National University, 2002). Accordingly, the total expenditure of medical insurance will exceed the total revenue of premium, increasing financial crisis of medical insurance system. The deficit of medical insurance is estimated to be 9.3 trillion won in 2011 but will increase to 37.2 trillion won in 2030, accumulated to 317 trillion won during this period; the ratio of expenditure to revenue of medical insurance will increase 1.36 to 1.61 during the same period. It is estimated that the premium rate need to increase by 8% every year from the current rate of 5.08% to balance the revenue and expenditure of medical insurance in 2017, assuming that the medical insurance fee increase by 3% every year. In this case, the ratio of national medical expenditure to GDP is estimated to increase from 7.3% in 2011 to 7.7% in 2020 and 10.6% in 2030.

Figure 14. Projections for Revenues and Expenditures Medical Insurance, 2011-2030



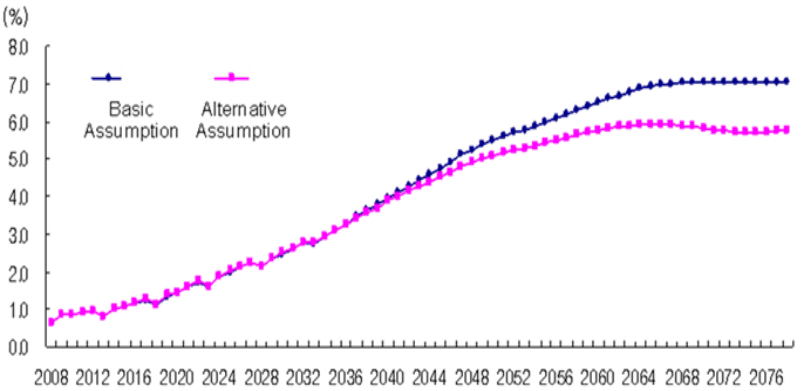
Source: Kim. et. el.,(2007). Long-term Prospects of Finance of Health Insurance of Policy Options.

Baby-bust and National Finance

As the expenditure for pension, medical insurance, and the other areas of social welfare increases along with the baby-boomers entering the elderly group, the ratio of the total expenditure to GDP will increase; the ratio of pension to GDP from less than 1% in 2010 to 6% in 2050, the ratio of health insurance to GDP from 2.87% to 4.6～5.5%, the ratio of long-term care insurance from 0.27% to 0.8%, respectively(Moon. et. al., 2004). However, the number of contributors in the future has sharply shrunk and hence the financial deficit will expand unless there are change in policy and/or reduction in expenditure. On a basis of fiscal revenue and expenditure criterion as of 2009, the fiscal deficit excluding expenditure for pension and medical insurance is estimated to increase by 5% of GDP in 2050, causing the fiscal deficit to 10% of GDP. Thus, the economic growth rate will rapidly slow down after 2020 and the scale of governmental debt will exceed 300% of GDP, which may lead to national bankruptcy (IMF, 2008). The ratio of taxation against national income may need to increase by about

4～5% point (or 20~25% than the current level) in 2050 and the tax burden plus premiums for national pension and health insurance may need to increase by about 6～7% point (or 22~26% than the current level) in 2050. Such a big burden may cause the conflicts between generations.

Figure 15. Ratio of National Pension Expenditure to GDP, 2008-2078

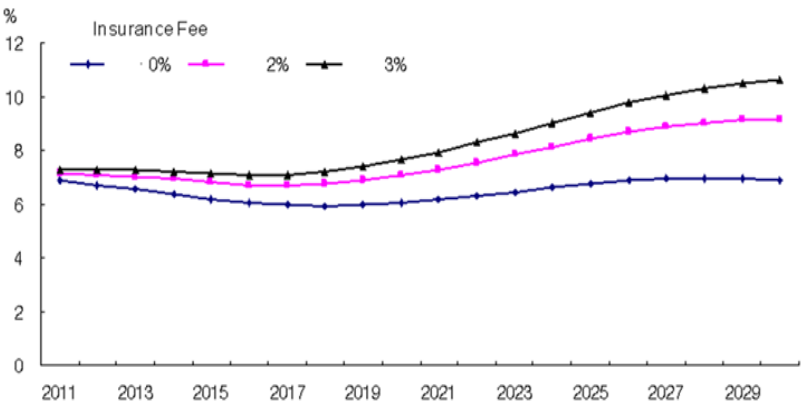


Note: Basic assumption means that TFR will go up to 1.28 and thereafter such a level will continue.

Alternative assumption means that TFR will go up to 1.60 and thereafter such a level will continue.

Source: National Pension Finance Estimate Committee (2008). Long-term Projection for Nation Pension Finance and Future Direction.

Figure 16. Ratio of National Medical Expenditure to GDP, 2011-2030

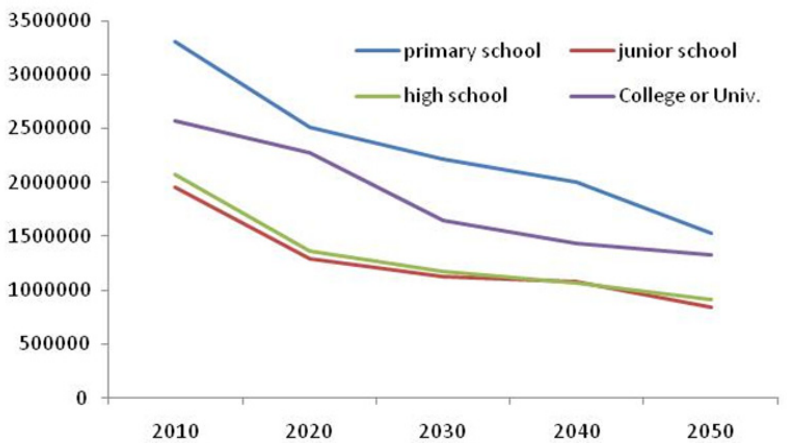


Source : Kim. et. el.,(2007). Long-term Prospects of Finance of Health Insurance of Policy Options.

Baby-bust and Education

Due to low fertility, school-aged children (6~21 years old) will decrease 9.90 million in 2010 to 4.60 million in 2050; primary school-aged children will decrease from 3.30 million in 2010 to 2.51 million in 2020, secondary school-aged children from 4.03 million to 2.65 million, and college or higher school-aged children from 2.57 million to 2.27 million, respectively.

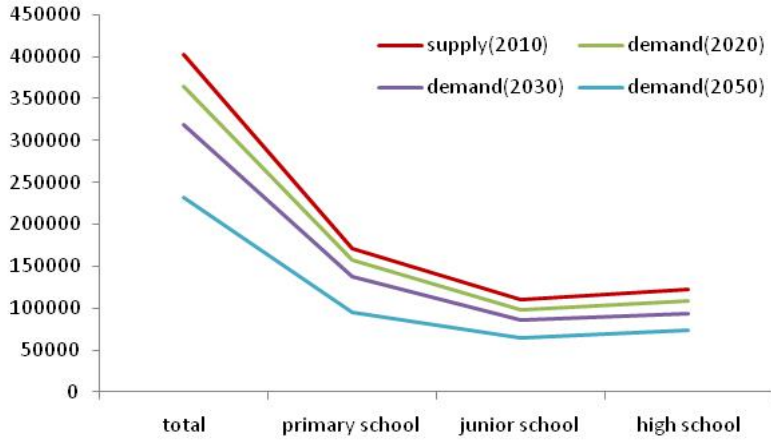
Figure 17. Projections for School-Aged Children, 2010-2050



Source : Korea National Statistical Office (2006). Future Population Projection.

Along with decrease in school-aged children, demands on teachers and schools will decrease. The demand on teachers is estimated to decrease from 405 thousand teachers in 2010 to 232 thousand teachers in 2050. In reality, the number of teachers appointed for primary school has decreased from 8,884 teachers in 2003 to 4,433 teachers in 2007. The demand on school is also estimated to decrease from 10,908 schools in 2010 to 6,850 schools in 2050. In reality, there have been some of schools abolished due to lack of students in some areas. In 2016, the entrance quota for colleges and universities will exceed the number of graduates from high schools, for which restructuring colleges and universities may be needed.

Figure 18. Projections for Demands on Teachers, 2010-2050

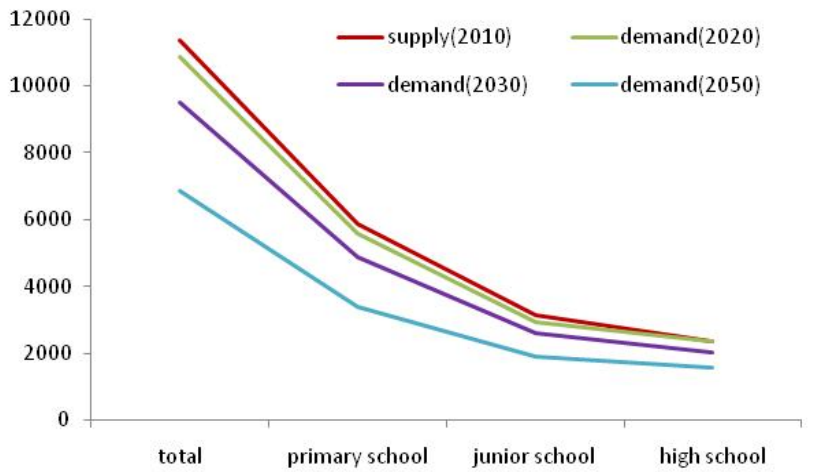


Note : 1) Assuming the number of students per teacher will decrease from 19.8 for primary school, 18.4 for junior school and 15.7 for high school to average level of OECD countries 16.0, 13.2, 12.5 respectively.

2) Number of teachers in 2010 will continue in the future.

Source: Ministry of Education, Science and Technology. (2010)

Figure 19. Projections for Demands on School, 2010-2050



Note: 1) Assuming the number of students per school will decrease from 27.8 for primary school, 34.4 for junior school and 34.2 for high school to average level of OECD countries 21.4, 23.4, 23.4 respectively.

Source: Ministry of Education, Science and Technology. (2010)

Ⅴ. CONCLUDING REMARKS

Korea's baby-bust, resulting in serious demographic imbalance, will send profound shockwaves through its socioeconomic future. What we will end up faced with when left in lowest low fertility situations long enough will be desperate in the future. Absent sufficient policy responses to the rapid changes in demographic structure, sustainable social development cannot be ensured for a future Korea. Raising fertility and finding feasible policy solutions to aging population are thus necessary conditions to keep Korea going along the path of sustainable development.

The Korean government in 2005 enacted the Basic Law on Low Fertility and Population Aging and by the next year implemented the First Five Year Plan for Low Fertility and Aging Society, which was followed earlier this year by its sequel. The Basic Plan was composed of three areas of policies such as "Strengthen Social Responsibility for Childbirth and Childcare", "Create Family-friendly Culture with Gender Equality", "Foster Health and Sound Future Generation" to raise the fertility rate; the First Basic Plan was rather focusing on providing socio-economic supports to help people be pregnant, give births and rear children and the Second Basic Plan is keyed to helping women balance work and family. The challenge of raising fertility is a case of the tragedy of the commons. It is a challenge that goes beyond individuals. Government's policy effort alone is necessary but not sufficient. The corporate sector, public organizations, and localities all should take part in fostering family-friendly working environments. The government needs to strengthen its support for such firms and localities.

Having gone through a quarter-century of low fertility, it seems to be a nonstarter to expect Korea's fertility rate to rise to anywhere near the replacement level in the foreseeable future.

Instead, in light of the current demographic structure of the country, what the future holds is, of necessity, a further aging of the population. Even should there be a rapid increase in the

fertility rate, as we all hope, it will nonetheless take long before it will have any tangible effect on the structure of the population. That said, the focus is not only on raising fertility rate, but also on constantly improving the socioeconomic makeup of the country so as to minimize, if not forestall altogether, the downsides of an aging society.

Further improvement of Korea's multi-pillar, post-retirement income protection system is a must; and more efficient ways will be sought to restore financial stability to the National Health Insurance. As the baby-boomer generation begins to age out of the workforce, policy efforts are ongoing to create jobs of varying flexibilities and responsibilities for older workers, with a view to helping them remain employed longer than they otherwise would. Also, as women and foreign workers can serve as an offset to potential labor shortages, it is important that they are provided with conditions where they can actually perform that role.

In closing, policy responses to changes in demographic structure should be made in a wide range of sectors, including education, housing, and finance, and that making these responses work will require not only the commitment of the government and the current generation, but also the cooperation of the private sector, future generations, and many others in the international community.

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Old Age and Inequality : focusing on income and expenditure

Sochung Lee[1)]

Ⅰ. BACKGROUND

Korean elderly population has risen to more than 10% of total population and is still continuing to rise at the fastest speed. Moreover, the average lifespan of Koreans is also increasing, indicating that the welfare or diswelfare of older people is becoming more of a national concern. Welfare(or diswelfare) of older people could be measured in various ways and economic inequality is one of the most representative indicator. In this respect, inequality has been a long-time subject in the field of social policy.

However, previous researches were limited in three aspects. First, there was a lack in lifecourse perspective in analyzing inequality. More specifically, few researches have focused on inequality of "older adults" for there has been a tacit agreement within Korean society that welfare indicators of older households are less important than that of the society in general. Such belief has become quite erroneous because as mentioned earlier, one fifth of total Korean population will be older adults in less than two decades implying that inequality of older households will explain a large part of total inequality of our society.

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Second, there are few researches focusing on the internal inequality of older people. That is to say, older adults were regarded as a homogeneous group, in that they share similar demographic characteristics. Thus the focus of most analysis on inequality of older adults was on inequality between generations. However, older people are as diversified as the society in general, possessing different levels of resources formed throughout the life course of each individual. Third, most of the research focused on income as a representative for economic inequality. However in the so-called modern consumer society consumption does not subordinate to income and thus the significance of consumption in itself has grown.

In this respect, this study to analyze the changes in inequality structure of Korean older adults aged 65-74 by focusing both on income and expenditure.

Ⅱ. DATA AND METHODOLOGY

Data

The year 1999, 2002, 2005, 2008 data of “Household Income and Expenditure Survey(HIES)” provided by Statistics Korea was used for analysis. HIES has been launched in 1963 with the purpose of estimating changes in household income and expenditure. The data is collected monthly and disseminated quarterly and contains information on various sources of income and sub items of expenditure. HIES is especially renowned for its sophisticated information on expenditure and is widely used in studies of expenditure.

Methodology : Gini decomposition

The most commonly used indicator for inequality is the Gini index. The Gini has a natural geometric interpretation as 1 minus twice the area between the Lorenz curve and the diagonal line representing perfect equality. However it is difficult to estimate specific characteristics of distribution through the Gini. In other words, it is difficult to decide whether the distribution is concentrated on the lower income or the upper income households through the Gini. Thus, several authors like Kakwani(1980), Yitzhaki(1983) have developed versions of the extended Gini and derived a method for decomposing the Gini by income source and calculating the marginal effects on inequality. Among the previous achievements, this study employed the Gini decomposition formula suggested by Lerman & Yitzhaki(1984, 1985). Lerman&Yitzhaki have showed that a variable's(say income's) overall Gini may be represented as the sum of components attributed to the elements(say, income sources) making up the variable. Thus, by decomposing the Gini, it possible to calculate marginal contributions of each element to inequality. The derivation process is as follows(Lerman&Yitzhaki, 1984).

One formula for the absolute Gini is

$$A = \int_a^b F(y)[1 - F(y)]dy \qquad (1)$$

Where A is half of Gini's expected mean difference, a is the lowest and b is the highest value of the variable y, and F(y) is the cumulative distribution of y. Using integration by parts, with $u = F(y)[1 - F(y)]$ and $v = y$,we obtain

$$A = 2\int_a^b y[F(y) - \frac{1}{2}]f(y)dy \qquad (2)$$

By transformation of variables, defining y(F) as the inverse function of F9y), we obtain

$$A = 2\int_0^1 y(F)(F-\frac{1}{2})dF \qquad (3)$$

Note that F is uniformly distributed between [0,1] so that its mean is $\frac{1}{2}$ .This means that (3) can be written as

$$A = 2cov[y, F(y)] \qquad (4)$$

Dividing by the mean of y yields the relative Gini. Given (4), it becomes simple to calculate the Gini. First, obtain the rank® for each observation i. Next, calculate the covariance between R and y. Since R/n terms are the empirical representation of F(y), one must divide this covariance by n. Divide the covariance by mean y, multiply by 2 and then, there's the Gini of y.

Here $Cov[y_k, F(y)]$ implies covariance of a certain income source and the rank of total income, thus the concentration index of the income of certain source. Therefore, the above equation can be expressed as follows by multiplying μ_k

Both to the numerator and the denumerator.

$$Gini = \sum_{k=1}^{K} \frac{Cov[y_k, F(y)]}{Cov[y_k, F(y_k)]} \cdot \frac{2Cov[y_k, F(y_k)]}{\mu_k} \cdot \frac{\mu_k}{\mu_y}$$

$$Gini = \sum_{k=1}^{K} R_k G_k S_k$$

R_k stands for gini correlation index, representing the ratio between the covariance of each income source and the rank of total income and the covariance of each income source and the rank of each income source. G_k stands for the gini of income source and S_k the share of income source within total income. Absolute share of income inequality of each income source can be calculated by multiplying $R_k \times G_k \times S_k$ the sum of which equals to total income gini.

Ⅲ. RESULTS

Income inequality of Korean older adults

The result of gini decomposition of income inequality is shown in Table 1. To put it in a more visual way, total gini coefficient, total share of income, relative share of inequality and marginal effect are shown in Figures.

The Gini coefficient changes during the past decade is shown below in Figure 1.

Table 1. Income and expenditure data provided by HIES

	Sub categories
Income	
Earned income	Earned income of householder and other members of household
Business income	Business income of householder and other members of household
Asset income	Interest income, dividend income, rental income, other asset related income
Transfer income	Public transfers, private transfers
Non regular income	Gifts, donations, lump sum pension, etc.
Expenditure	
Food	Grains, meat, fisheries, vegetables, fruits, dining out, etc.
Housing	Rents, house repair costs, etc
Water and Electricity	Water, electricity, heating, etc.
Domestic goods	Furnitures, dishes, domestic appliances, beddings, housing services, etc.
Clothings	Clothes, shoes, services related to clothings
Health	medicines, health related items and services
Education	Educational fees, supplementary educational fees, stationary, etc.
Leisure	publications, leisure service, leisure items etc
Transport and Communication	Transport, communications
Others	cigars, hairdressing, accessories, gifts, donations and miscellaneous

Figure 1. Gini coefficient of income sources

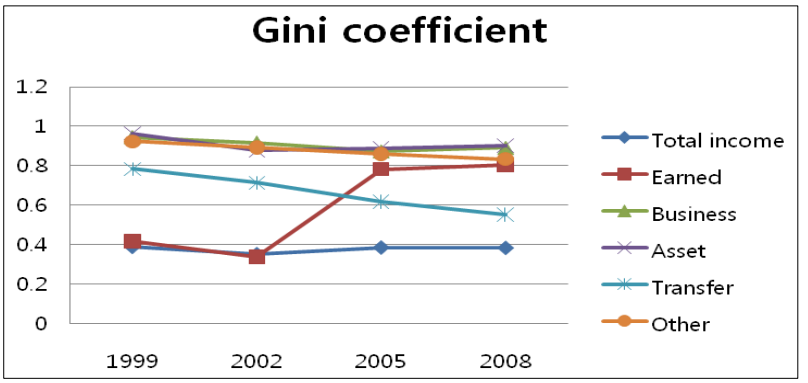
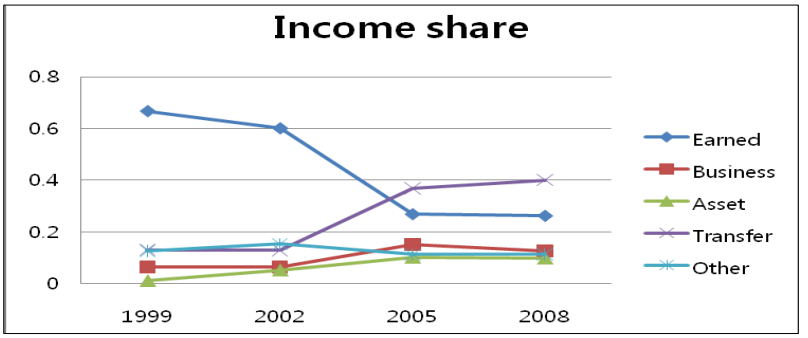


Table 2. Income inequality effects by income source

		Gini(G)	share of income(S)	share of inequality(I)	relative share of income inequality(J=I/G)	marginal effect(J/S)
1999	earned	0.41828	0.667429	0.2379	0.612007	0.916962
	business	0.94601	0.063839	0.031164	0.080172	1.255843
	asset	0.96471	0.012027	0.00179	0.004604	0.382849
	transfer	0.78386	0.130268	0.02787	0.071697	0.55038
	other	0.92379	0.126438	0.089997	0.23152	1.831102
2002	earned	0.33907	0.600785	0.159532	0.451626	0.751726
	business	0.9181	0.064552	0.027738	0.078525	1.216457
	asset	0.87711	0.052466	0.023208	0.0657	1.252243
	transfer	0.71418	0.129421	0.042607	0.120617	0.931978
	other	0.89135	0.152777	0.100155	0.283532	1.855862
2005	earned	0.78256	0.267769	0.114792	0.297861	1.112379
	business	0.87238	0.150239	0.061174	0.158735	1.056547
	asset	0.88726	0.100703	0.036517	0.094754	0.94092
	transfer	0.61801	0.368972	0.110927	0.287833	0.780094
	other	0.85897	0.112316	0.061977	0.160817	1.431831
2008	earned	0.80504	0.261384	0.122847	0.3202462	1.225196
	business	0.89074	0.126835	0.054598	0.1423307	1.122173
	asset	0.90276	0.097295	0.038695	0.1008716	1.03676
	transfer	0.55302	0.400831	0.110306	0.2875519	0.71739
	other	0.83436	0.113656	0.057157	0.1489996	1.310976

Judging from the changes in gini by year, income inequality of older households decreased slightly in the early 2000s, nevertheless increased again afterwards and regressed to the times right after the economic crisis. As for the inequality trend of income sources, inequality of earned income rose abruptly between the year 2002 and 2005, whereas the inequality of other income sources decreased to a certain extent. However, the increase in the inequality of earned income has to be translated cautiously for much of the change could be explained by changes in the dataset[1]. Although the gini shows overall inequality trend, it is difficult to tell the exact influence of each income sources on total income inequality, thus it is necessary to analyze relative share of each income sources among total inequality and the marginal effect. The result is show in Figures below.

Figure 2. Income share of each income source(by year)



Changes in the income share of each income component can influence the gini. Figure 2. shows changes in income share of each income component by year. Changes in the share of earned income is conspicuous for it dropped from 0.67 in 1999 to 0.26 in 2008. As mentioned previously this could be explained in large part by changes in the sample of dataset. Apart from

1) Until 2002, the Household Income and Expenditure Survey only included households living in urban area. However, there was a restructuring of the dataset in 2003 to include households living in rural areas.

earned income, the share of 'other income' decreased as well. On the contrary, the share of transfer income almost tripled during the past decade, recording 0.13 in 1999 to 0.4 in 2008. The share of asset income also increased, though minute in scale, from 0.01 in 1999 to 0.09 in 2008 and the share of business income is another income component showing increasing trend(0.06 in 1999 to 0.13 in 2008). From the dataset, it is possible to conclude that the share transfer income, asset income and business income increased during the past decade in older households, substituting the decrease in earned income.

Figure 3. Relative share of income inequality of each income source(by year)

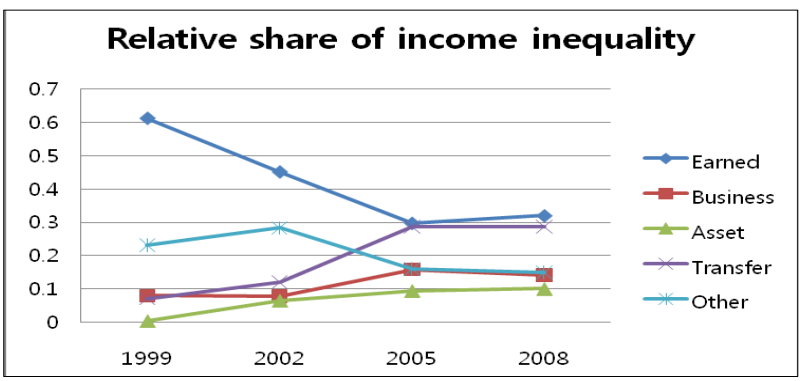
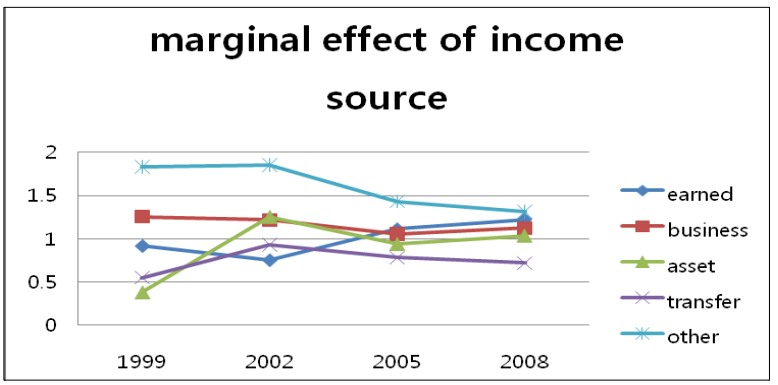


Figure 3. shows changes in the relative share of each income components on income inequality. As explained in the earlier part of this paper, relative share of income inequality is calculated by dividing the gini coefficient with total gini, indicating how much of total gini can be explained by each income component. The result shows that up until the early 2000s, earned income explained the largest part of total gini, followed by other income, transfer income, business income and asset income in order. After the mid 2000s, earned income still explains the largest part of total income gini, however, the size decreased abruptly. Also, changes took place regarding the

relative share of income inequality of other income components : the relative contribution of transfer income increased, converging to the relative contribution of earned income.

However, calculations on the relative share of income inequality is limited in that changes in the share of each income component can affect the outcome. Thus, we need to look into the marginal effect of income components, calculated by dividing relative share of each income source among total inequality by the share of each component. The result is shown in Figure 4.

Figure 4. Marginal effect of income components



Previously we have noted that the relative contribution of earned inequality to total inequality decreased, however, marginal effect shows that such result was indeed brought by decrease in the share of earned income, for marginal effect of earned income increased from 0.9 in 1999 to 1.2 in 2008. If the marginal effect of a certain income component is larger than 1, it means that the distribution of income component is more unequal than total income inequality. Thus, it is possible to infer from the fact that the marginal effect of earned income exceeded 1 in 2008 that earned income is deteriorating income inequality. The marginal effect of business income decreased from 1.3 in 1999 to 1.1 in 2008 but the absolute value has been larger than one for the past decade, implyng that the distribution of business income is more unequal than total

income. On the other hand, although the relative contribution to total inequality of transfer income increased most, the absolute value of marginal effect remained below 1 throughout the whole period, indicating that transfer income is an income source that contributes to lowering the inequality of total income.

Expenditure inequality of Korean older adults

The total inequality of expenditure of Korean older household decreased during the past decade. Such decrease in expenditure inequality could be translated in several aspects. First, after the year 2000, Korea had to face the issue of rapid aging of society and introduced fundamental welfare policies for the older people such as old age allowance, long term care. Increased welfare policy, especially for low income households could have contributed to lowering the level of inequality. Second, after the year 2000, it has been analyzed by some sociologists that Korea has entered the so-called stage of 'modern consumer society'. In modern consumer society, consumption has gained more meaning in everyday lives than a mere means of reproducing labor, namely the symbolic meaning of consumption. One of the characteristics of modern consumer society is that consumption trend has become more general, which is contrasting to the type of consumption in the beginning of the 20th century, the era of 'conspicuous consumption' by Thorstein Veblen. Generalized spending could lead to more equalized spending, however, such hypothesis needs to be confirmed with more discretion, which is beyond the scope of this article.

Concerning the expenditure inequality of Korean older households, food, clothing, education, other expenditures are the items which has become more unequal during the past decade, whereas housing, water and electricity, domestic goods, health service, leisure and transport and communication costs show contrary trend.

Table 3. Expenditure inequality effects by expenditure components

		Gini(G)	share of income (S)	share of inequality (I)	relative share of income inequality (J=I/G)	marginal effect(J/S)
1999	Food	0.32312	0.308273	0.073523	0.19558	0.634439
	Housing	0.89835	0.047897	0.0256	0.068099	1.421783
	water&electricity	0.45547	0.070062	0.012731	0.033865	0.483359
	domestic goods	0.86761	0.027614	0.013498	0.035906	1.300295
	clothing	0.77907	0.044311	0.02294	0.061023	1.377157
	health	0.84368	0.060058	0.028687	0.076311	1.270613
	education	0.92086	0.026375	0.009285	0.024698	0.936438
	leisure	0.75376	0.038225	0.019313	0.051376	1.34403
	transport communication	0.60309	0.111227	0.05245	0.139522	1.25439
	others	0.59356	0.236226	0.117897	0.31362	1.327624
2002	Food	0.33363	0.29317	0.070459	0.170378	0.581157
	Housing	0.88205	0.051989	0.027708	0.067002	1.288778
	water&electricity	0.43012	0.073282	0.009875	0.023879	0.325855
	domestic goods	0.84816	0.047803	0.020782	0.050252	1.051229
	clothing	0.77246	0.043797	0.022613	0.054681	1.248497
	health	0.77023	0.101051	0.056963	0.137743	1.363103
	education	0.95953	0.022255	0.010236	0.024752	1.11217
	leisure	0.75155	0.033908	0.019499	0.047151	1.390564
	transport communication	0.52741	0.102539	0.053123	0.128458	1.252772
	others	0.56837	0.230207	0.122288	0.295705	1.284521

Table 3. (Continued)

		Gini(G)	share of income (S)	share of inequality (I)	relative share of income inequality (J=I/G)	marginal effect(J/S)
2005	Food	0.34444	0.290301	0.074019	0.194783	0.670967
	Housing	0.86499	0.049966	0.025849	0.068023	1.361387
	water&electricity	0.42803	0.067407	0.010696	0.028147	0.417564
	domestic goods	0.79454	0.033037	0.016359	0.04305	1.303078
	clothing	0.78922	0.037797	0.017662	0.046477	1.229651
	health	0.73507	0.106763	0.047126	0.124013	1.161576
	education	0.95268	0.026138	0.010391	0.027345	1.046197
	leisure	0.77497	0.043837	0.024102	0.063426	1.44685
	transport communication	0.54941	0.134946	0.05539	0.145761	1.080142
	Others	0.58124	0.209808	0.098413	0.258976	1.234347
2008	Food	0.35955	0.291668	0.077495117	0.203681	0.698332
	Housing	0.8372	0.047425	0.019681262	0.051728	1.090734
	water&electricity	0.43269	0.071403	0.013012258	0.0342	0.478971
	domestic goods	0.80985	0.035309	0.017757993	0.046673	1.321876
	Clothing	0.81123	0.036281	0.017373448	0.045663	1.258584
	Health	0.7523	0.111804	0.053990424	0.141903	1.269221
	Education	0.96909	0.015894	0.005131503	0.013487	0.848587
	Leisure	0.74044	0.039093	0.019964893	0.052474	1.342273
	transport communication	0.52535	0.12849	0.049460784	0.129998	1.011738
	Others	0.59014	0.222633	0.106605144	0.280191	1.258535

Figure 5. Total expenditure gini of Korean older adults

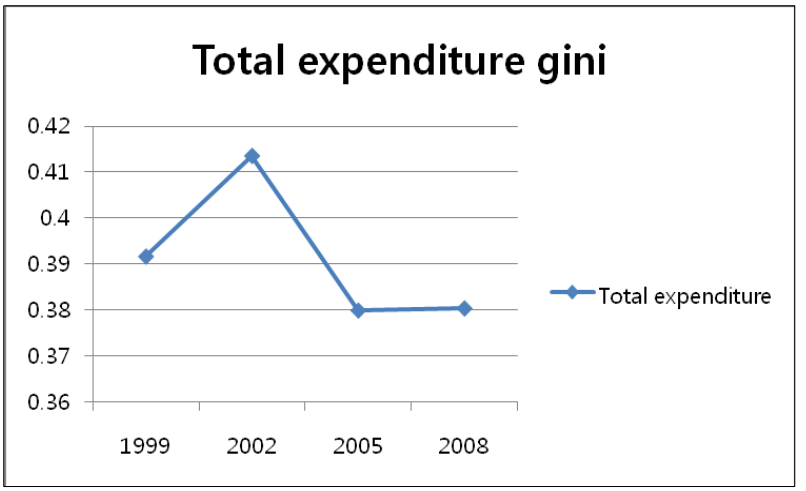


Figure 6. Gini by expenditure items

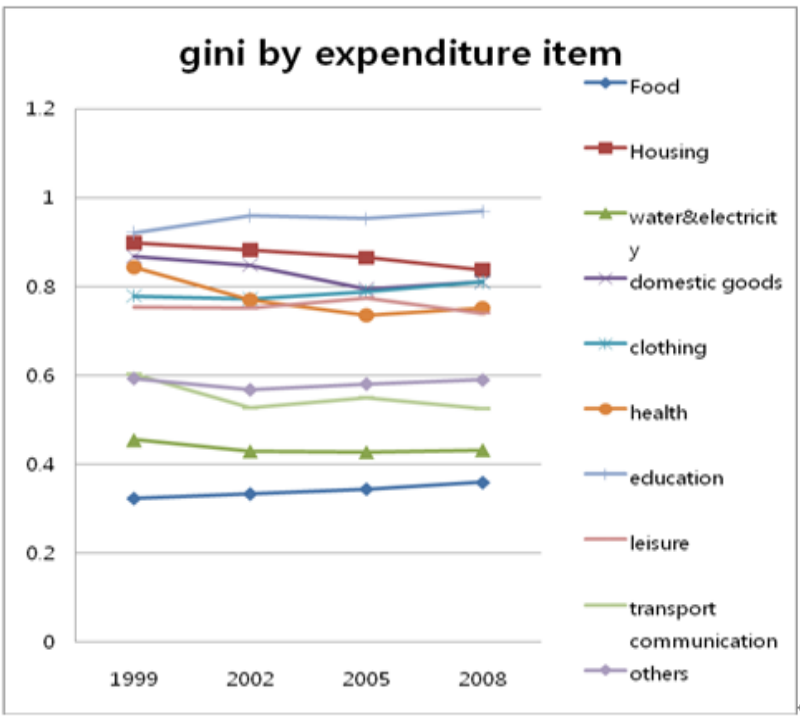


Figure 7. Component share of total expenditure

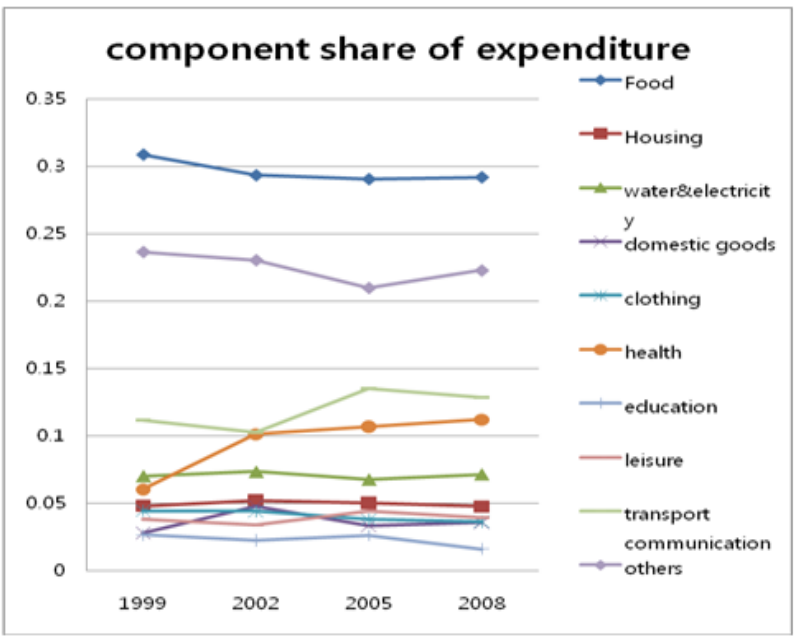
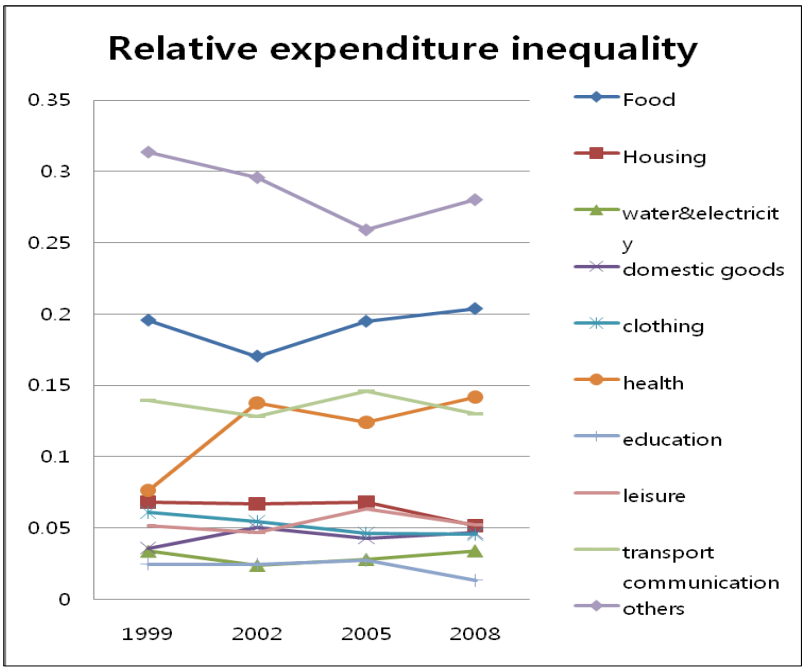


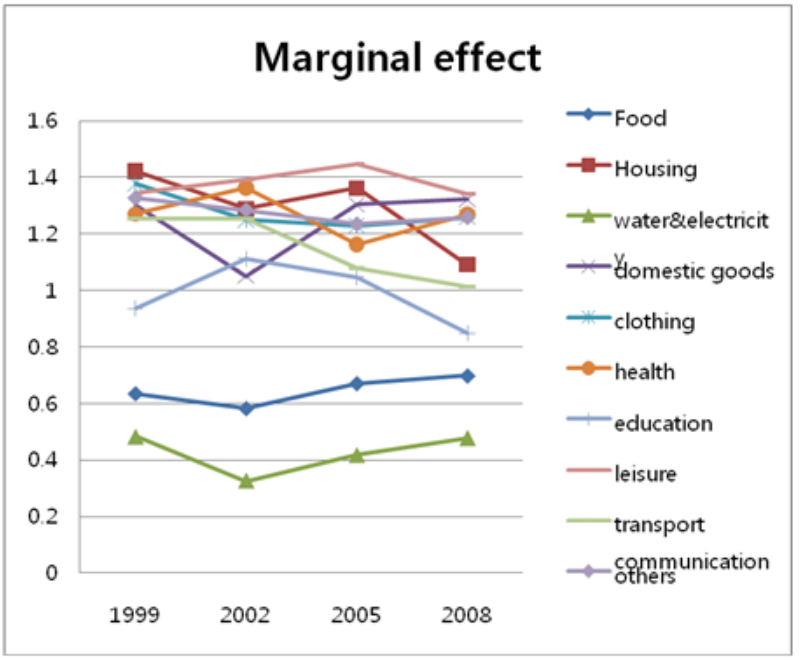
Figure 7. shows that Korean older households spend most on expenditure items such as food, others, transport and communications, health, etc. The 'others' items include miscellaneous expenditures such as cigarettes, hairdressings, especially all sorts of relational expenditures such as gifts on weddings, condolence money, and membership payments for mutual societies take much of the 'others' item. Thus, it is possible to conclude from the high component share of 'others' items that a large share of expenditure of Korean older households can be explained by relational spending. The share of transport and communications, health, leisure tend to increase whereas expenditure share of food, others, housing, water and electricity, clothings and domestic goods shows decreasing trend. In short, spending share on necessary items such as food, housing, water and electricity, etc tend to decrease whilst items representing lifestyles of modern society such as transport and communications and leisure tend to increase.

Figure 8. Relative share of total expenditure inequality



Relative component share of expenditure is the share of each component gini among total gini, indicating the amount of gini explained by the gini of certain component. As shown in Figure 8. the gini of 'others' item seems to contribute most to total expenditure gini, with food, health, transport and communications coming next. The relative share of expenditure inequality of items such as food, health, leisure is increasing after the year 2000 whereas relative share of total inequality of housing shows decreasing trend.

Figure 9. Marginal effect of expenditure components



However, it is difficult judge from relative share of total inequality whether certain expenditure item is unequal in character or not because changes in the relative share of total inequality can be affected by changes in the share. Thus, in order to analyze the exact character of a certain component, it is necessary to analyze the marginal effect, which can be calculated by dividing the relative share of total inequality by component share. According to Figure 9. the marginal effect of all the consumption items of older households except for food, water and electricity, education is larger than 1, implying that the distribution of most consumption items is more unequal than total expenditure inequality. Among the unequal items, we need to pay more special attention on items such as leisure, domestic goods, clothing, health and others, the items with larger absolute value of marginal effect.

Ⅳ. SUMMARY AND IMPLICATIONS

The following conclusions can be drawn from this research.

First, the analysis showed the importance of transfer income in old age inequality. The income inequality of older households alleviated during the past ten years and it is not too much to say that such consequence was brought by decrease in the inequality of transfer income. That is to say, the component share of transfer income increased during the past ten years and thus contributed to increasing the gini. However, the value of marginal effect is as large as 0.5~0.6 indicating that the distribution of transfer income is more equal than total income. Such result implies the importance of public transfer income such as pension and old age allowance and in order to bring income inequality of older households, it is necessary to improve public income transfer policies to achieve policy stability and effective outcome. In particular, income inequality during mid-life will obviously lead to increased inequality in old age, thus policies to supplement earned income gaps and inequality during mid life are also important in improving old age inequality.

Second, contrary to the fact that income inequality of older household is decreasing, expenditure inequality shows increasing trend. However, it is worth noticing the fact that leisure is an item contributing most to such trend. That is to say, the relative share of total expenditure inequality of leisure is quite minimal owing to minute share of total consumption. Despite the fact, the relative share of total expenditure inequality increased during the past decade. Moreover, the value of marginal effect was constantly larger than 1 for the past ten years, indicating that leisure is consumed unequally. Marginal effects of health, others, clothing and domestic goods are also larger than 1, indicating that total expenditure inequality of older households could be explained by increased inequality of such consumption items.

Last but not least, we need to pay special attention to leisure. Although the component share of leisure is minute, leisure is still a very unequal item and seems to be growing more

unequal after the year 2000. The importance of leisure in modern consumer society could be embedded in such result. However, considering the fact that leisure is an item that not only contributes to individual satisfaction but also to the satisfaction of the society as a whole, it is possible to regard leisure as an important policy arena. For example, social service which has until now dealt with care could be extended to cover services concerning leisure, so as to contribute to enhancing the life satisfaction of people and also to achieve leisure equality by enabling collective consumption of leisure through public service. service and programs could be provided collectively

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Aging baby boomers and health care finances: National Health Insurance and Long-Term Care Insurance

Yunkyung Lee[1)]

In 2010 when the first of Korean baby boomers started turning 55, policy makers paid a great deal of attention to the aging of the baby boom generation. This attention was mainly paid to the possible effects baby boomers will have on society as the majority of them reach their retirement age of 55 in Korea.

The Korean government developed the first five-year "Plan for Aging Society and Population 2006-2010" to deal with the low fertility and aging issues facing the nation. The second five-year plan was mapped out in 2010 which primarily aimed at addressing issues related to the aging of the baby boom generation. The second five-year plan mainly consisted of four policy measures targeted at providing various employment opportunities; establishing multi-faceted income security schemes for old age; ensuring preventive health management; and strengthening life planning for post-retirement days. These measures were designed to assist baby boomers in successfully planning their post-retirement times and to prevent possible reduction in financial resources used to provide social security for the baby boomers.

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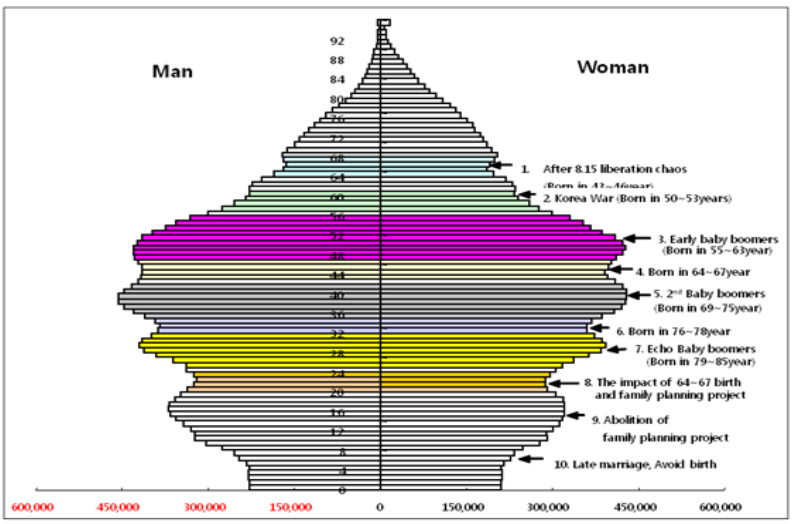
The aging of baby boomers is likely to impose burdens on many parts of government's finances, especially by providing old-age income security and health security. However, the severity of financial burdens caused by health insurance can be less than the financial burdens caused by income security depending on the health and functional status of seniors and systematic design of health care schemes. Fortunately, baby boomers will begin to reach the old age (aged 65 or older) in 2020, ten years from now, hence we have time to take measures to address the aging of the baby boom generation.

This article identifies demographic changes expected to happen in 20 years' time when baby boomers enter old age, along with an outlook of health care expenditures based on the health care expenditures spent over the past 10 years. In addition, this article observes different lifestyles of baby boomers from older generations and what can be done to mitigate strains aging baby boomers can impose on public finances for health care.

Ⅰ. AGING OF BABY BOOMERS

Low fertility and lengthening life expectancy have emerged as important social issues in Korea since 2000. Demographic changes caused by the low fertility and population aging are expected to affect every aspect of society, such as labor market, welfare, economy and education. Figure 1. shows a population pyramid by age group. The bell-shaped population pyramid shows that the rise and decline in the population size among age groups in their teens and 50s are repeating. This is the result of the rapid rise in the birth rates and family planing in the aftermath of the Korean War. Korea experienced two waves of baby booms with the first-wave boomers born between 1955 and 1963 before the start of family planning policies. These age groups ranged from 47 to 55 in 2010, representing about 7.2 million people, or about 14.6% of the total population.

Figure 1. Population pyramid in Korea (2010)



Source: National Statistical Office, "2010 Population Prospects" \

Korea became greatly aware of these baby boomers in 2010, due in large part to the prospect that there will soon be a massive retirement of baby boomers from the labor market. In Korea, retirement generally begins as early as age 55 and economic activities tend to decline from age 60. While approximately 30% of the elderly aged 65 or older participate in economic activities, which is higher than those in developed countries, most of them are self-employed, farmers or unskilled workers in work places that do not have a retirement age. Most of the time, retirement around age 55 is involuntary, rather than voluntary. Therefore, the beginning of retirement by the enormous demographic pool of baby boomers raises concerns that they might impose increased burdens on society.

Baby boomers begin to enter old age (aged 65 or older) in 2020, and by 2030, the entire first generation of baby boomers will have entered old age. The ratio of the elderly population is forecast to reach 15.6% by 2020, with the percentage of seniors aged 80 or older growing to 3.6%. The ratio is likely to further rise to 24.3% by 2030, with the percentage of seniors aged 80 or older reaching 5.3%. Moreover, old-age dependency ratio is expected to grow from 15.0 today to 21.7 by 2020 and to 37.7 by 2030.

Table 1. Demographic changes with baby boomers entering old age

		2010	2020	2030	2040	2050
Early boomers		Start retirement	Enter old age	First wave of baby boomers enter old age	Enter very old age	
Population size	Total population	48,874,539	49,325,689	48,634,571	46,343,017	42,342,769
	65 or older	5,356,853	7,701,125	11,810,707	15,040,907	16,155,757
	65-79	4,405,175	5,918,318	9,229,867	10,629,224	10,025,537
	80 or older	951,678	1,782,807	2,580,840	4,411,683	6,130,220
Ratio of the elderly population	Old-age dependency ratio (per 100 persons)	15.0	21.7	37.7	56.7	72.0
	Ratio of the elderly population (65+)	11.0	15.6	24.3	32.5	38.2
	Ratio of the elderly population (80+)	1.9	3.6	5.3	9.5	14.5

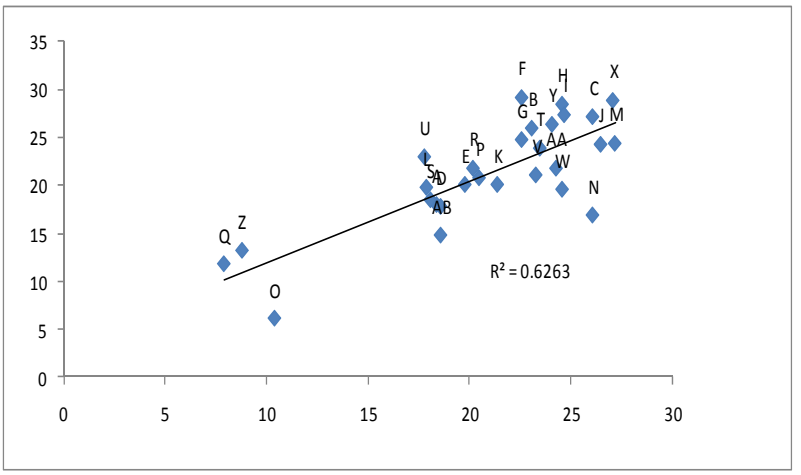
The aging of early baby boomers (hereinafter called "baby boomers") is expected to have negative effects on society in general, especially to the public finances on welfare. However, empirical studies indicate that the aging of baby boomers is not likely to lead to a substantial increase in public expenditures. Korea Development Institute (KDI, 2004) forecasted that the growth pace of public expenditures driven by the aging of baby boomers would be below 0.2%P annually, and the Korea Institute of Public Finance estimated that public expenditures for health and welfare would rise from 7.2% of GDP in 2010 to 8.9% of GDP by 2020 (Park Hyeong-su et al., 2008).

Thinking of the aging of baby boomers as a social crisis or even a catastrophe despite the findings of these empirical studies is an excessively pessimistic view. This article, therefore, will discuss how much influence aging baby boomers will have on the expansion of public expenditures and if there are ways to ease such trend. Social expenditures associated with population aging are likely to occur in the areas of basic livelihood security, old-age income security, public health care and health security, and other social services for the elderly, but this article will focus on social finances needed to protect the health of the elderly.

Ⅱ. AGING OF BABY BOOMERS AND PUBLIC FINANCES FOR WELFARE

Social expenditures used to support the elderly population generally cover basic livelihood security, social welfare services, public health care, health insurance and public pension. Among these, public health care, health insurance and public pension are greatly influenced by the size of the elderly population and incur the largest portion of expenditures. In particular, public pension is likely to be heavily affected by the growing number of seniors as it is basically an entitlement spending program. It is reported that the growing size of the elderly population generally leads to increased social expenditures. Figure 2. shows a correlation between dependency costs by country and their social security expenditures, which shows a high level of 0.6263 in the case of Korea.

Figure 2. Correlation between dependency costs and social security expenditures by country



A: Australia, B: Austria, C: Belgium, D:Canada, E:Czech Republic, F: Denmark, G:Finland, H: France, I: Germany, J:Greece, K:Hungary, L:Iceland, M:Italy, N:Japan, O:South Korea, P: Luxembourg, Q: Mexico, R:Netherlands, S: New Zealand, T: Norway, U:Poland, V:Portugal, W:Spain, X:Sweden, Y:Swiss, Z:Turkey, AA:UK, AB:USA

According to OECD statistics, Korea's public social expenditures was 7.5% of its nominal GDP in 2004, while its expenditures on welfare was about one-third of the OECD average. Public social expenditures are expected to markedly grow as Koreans earn more income and social welfare programs are getting more mature. KDI estimates that Korea's public expenditures on welfare will grow to 14.5% in 2020 and 20.3% by 2030. However, considering Korea's dependency cost level in 2020, its welfare expenditures will not be high compared to OECD countries.

Koreans spend less on health care compared to other countries. Health care costs as a percentage of GDP was 6.9% in 2009, which was lower than the OECD average of 8.7%. However, health care costs have rapidly grown in Korea over the past 10 years.

Table 2. Per capita health spending per year by age group

(Unit: KRW thousand)

	Total	0-19	20-39	40-64	65-69	70
2010	892	480	431	1,002	2,327	3,128
2009	809	437	401	932	2,161	2,797
2008	724	384	360	853	1,986	2,580
2007	677	367	350	824	1,885	2,342
2006	599	351	321	760	1,675	1,892
2005	519	315	291	675	1,486	1,593
2004	475	301	270	621	1,320	1,406
2003	440	294	255	583	1,212	1,265
2002	404	296	241	532	1,078	1,093
2001	385	298	239	507	983	984
2000	255	256	167	348	677	691
10-year growth rate	350	190	260	290	340	450

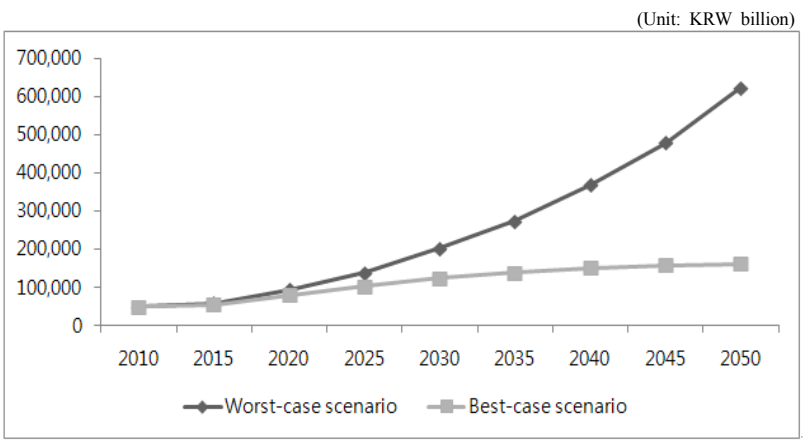
Between 2000 and 2010, per capita medical spending grew 350% annually from KRW255 thousand to KRW892 thousand. By age group, medical spending began to rapidly rise among people in their 40s and the spending was especially higher among people aged 70 or older. In 2010, per capita medical spending was KRW2,327 thousand among people aged 65-69 and KRW3,128 thousand among people aged 70 or older. The growth rate was particularly high among old people aged 70 or older.

However, it seems that the rising health care expenses are mostly attributed to expanded health care coverage and other related policies, rather than spending due to old age. The percentage of the elderly population grew approximately 4% from 7% in 2000 to 11% in 2010 during which service prices of the national health insurance rose 145% while medical spending increased 350%. Considering that consumer prices rose 134% during the same period, it seems that the overall rise in health care costs was driven by price hikes for medical services and increased use of expensive medical services brought about by the advances in medical technology, rather than by the aging of the population.

With the elderly people aged 65 or older spending more on medical services than those under 65, the proportion of health care expenses spent by the elderly exceeded 30% of national insurance benefit expenditures in 2010. While this seems quite a high ratio compared to the 11% of the elderly population, the numbers are not so surprisingly high considering high health care costs currently spent prior to deaths and the high incidence of chronic illnesses among the elderly.

Such a rapid rise in health care costs is a major topic of discussions as a social crisis facing Korea where a huge cohort of baby boomers is about to enter old age. One of the most dismal scenarios on future health insurance spending forecasts that if health care costs continue to be spent as they have been over the past 10 years, the overall spending will become approximately 12 times bigger by 2050 than in 2010.

Figure 3. Health insurance spending outlook



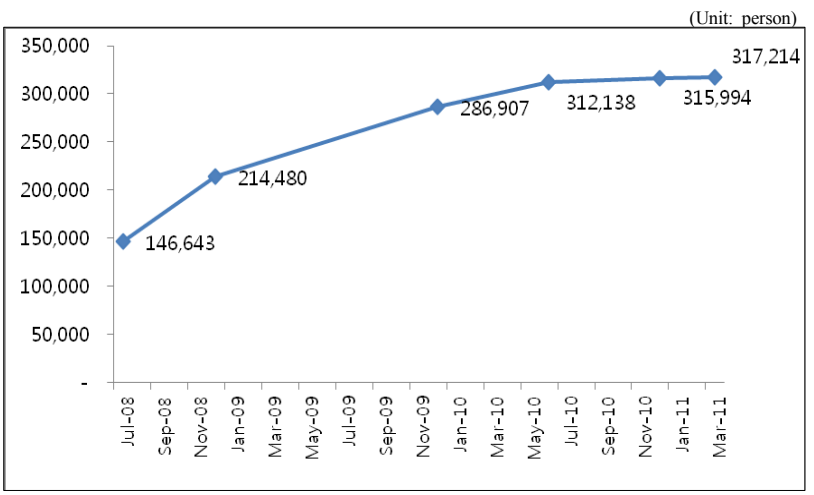
Note: 1) Assumptions used in the worst-case scenario: healthy aging is not taken into account; prolonged life expectancy does not lead to healthy life expectancy (additional longevity gains in bad health) and thus improved health conditions do not lead to reduced health care costs; residual cost grows at an average annual rate of 4.99% during the estimated period in line with the trend over the past 10 years

2) Assumptions used in the best-case scenario: healthy aging is taken into account; residual cost converges to zero in 2030 and remains at a zero percent growth until 2050

Source: KIHASA(2011), Future Strategy to Be Ready for 100-Year--Old Population

However, considering that health care spending over the past 10 years was mainly driven by institutional changes and expanded health care coverage, health care spending increases by institutional changes are expected to lessen down the road. According to a scenario that reflects this assumption, health care budget is forecast to rise approximately 3.6 times from 2010 to 2050, which means that there is room for the spending to decline compared to the worst-case scenario. In this scenario, the current spending growth steadily declines until it becomes zero in 2030 when baby boomers join the elderly population and remains that way until 2050.

Figure 4. Number of people approved to be eligible for long-term care



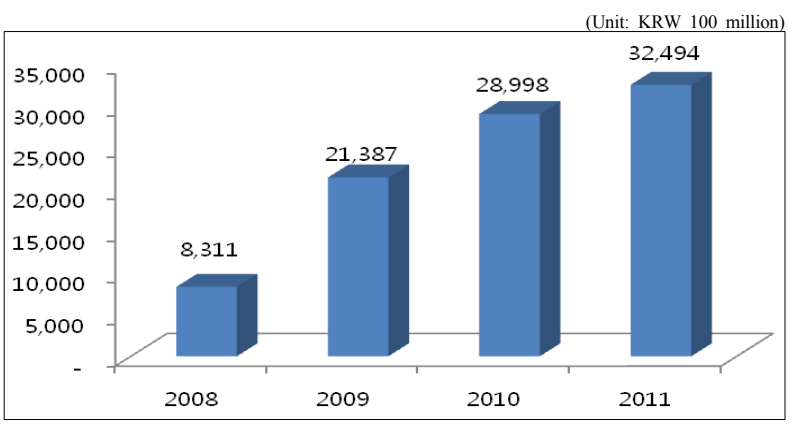
One of the financial burdens most likely to be imposed by the aging of baby boomers will be the overall rise in long-term care. In Korea, public long-term care insurance was introduced in 2008 to ensure that the society as a whole can meet the long-term care needs of the elderly. At the beginning of the program, there were not many applications for long-term care benefits due to the lack of awareness of the new program and Korea's tradition of taking care of parents within family.

The rate of using long-term care benefits even among those entitled to the benefits was less than 50% at that time. In two years, however, applications for getting ratings needed to get long-term care services rapidly increased, and more than 80% of entitled users received the services.

As mentioned earlier, the growing number of applications for log-term care benefits can be attributed to changes in the attitude among Koreans towards care giving for their parents. Koreans traditionally valued "filial duty" and thought it would be "undutiful" or shameful if they let others take care of their parents or send their parents to facilities. With the introduction of the long-term care program, these values have rapidly changed; today, people think of long-term care service as something anyone can use as long as they have needs for the service.

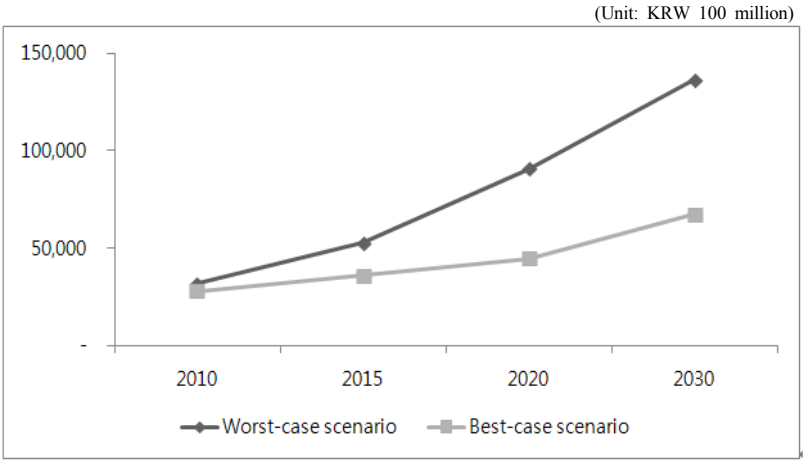
The increased number of long-term care users brought with it the increased finances required. Long-term care expenditures rose from KRW 2,138.7 billion in 2009 to KRW 3,249.4 billion in 2011. Korea's financing mechanism for long-term care is considered as quite stable, largely because the program targeted 3-5% of the elderly at the start so that it would not be financially burdensome, and it could manage its finances by controlling the way services were provided, applying the diagnosis related group (DRG) system and by utilizing social insurance.

Figure 5. Long-term care budget changes



Different researchers produce different estimations of beneficiaries and required financing for long-term care using different assumptions as is the case with the estimation of health care costs. Long-term care insurance is a level-based diagnosis related group program in which the estimation of the target beneficiary size greatly affects its finances. KDI (2010) provides two projections in regard to the scope of long-term care beneficiaries, one with the number of beneficiaries increasing to 1,453,000 people (12% of the elderly population), and the other growing to 658,000 people (ratio of long-term care users compared to the elderly in 2009: 5%) by 2030 when early baby boomers will fully come of old age. If the scenario (worst-case scenario) that predicts a marked increase in financial burdens is considered, required budget for long-term care services will grow approximately 4 times to KRW13,642.5 billion by 2030.

Figure 6. Projected growth in long-term care expenditures by scenario

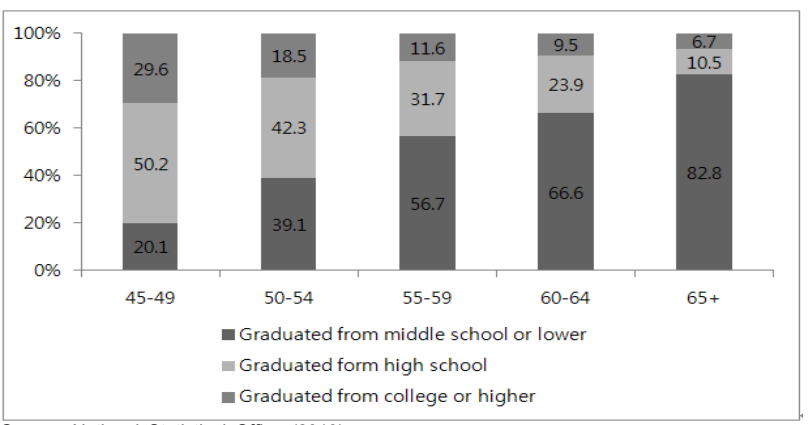


Ⅲ. WILL THE AGING OF BABY BOOMERS BECOME A MAJOR DRIVER OF RAPIDLY RISING HEALTH CARE FINANCES? ARE THERE WAYS TO STOP IT?

A. Characteristics of Korean baby boomers

Baby boomers show markedly different characteristics from the current elderly population. Among other things, baby boomers born after the Korean War enjoy a much higher level of education than any generation before them. While 82.8% of the current elderly are with middle school or even lower education, the majority of baby boomers aged 45-49, or 50-54 attained at least high school education, and the rate of boomers with college or higher level of education is on the rise. This difference in the educational level between baby boomers and the current elderly is one of the reasons why baby boomers are likely to have a different life after retirement. Different educational levels are expected to play a role in the jobs, values, leisure life of baby boomers, as well as in the way they prepare for life after retirement.

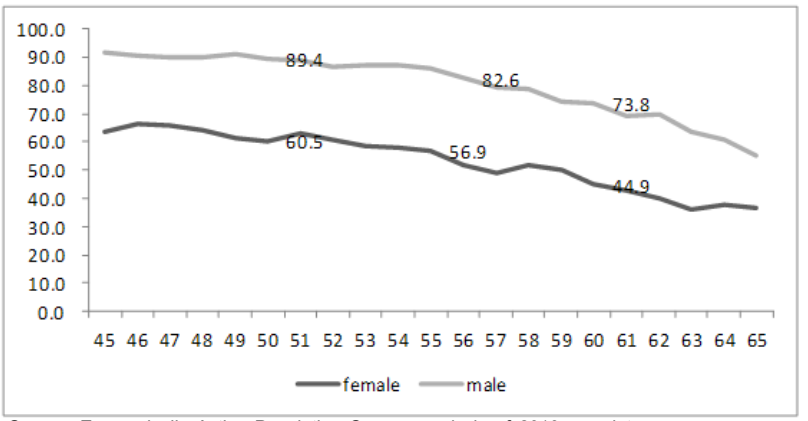
Figure 7. Educational levels of baby boomers vs. senior citizens by age group



Source: National Statistical Office (2010)

When it comes to baby boomer households, the typical family form was the nuclear family, with only 10.9% of baby boomers living with their parents. Also, 75.9% of baby boomers aged 47-55 were employed in 2010, with more male baby boomers employed than their female counterparts.

Figure 8. Workforce participation ratio by age group



Source: Economically Active Population Survey, analysis of 2010 raw data

Of Koreans aged 65 or older, about 30% of people were economically active, which was very high compared to other OECD countries. Many baby boomers considered working as important. As much as 86.7% of baby boomers wanted to continue working, and 63.9% of boomers wanted to continue working even after age 65. Moreover, 91.5% of baby boomers thought working is important in their post-retirement life.

The fact that baby boomers place a high value on work and intend to remain in the workforce as long as their health allows can be an important factor that can mitigate burdens on society when they come of old age. That is, as baby boomers remain financially capable past their retirement age, they not only will contribute to easing financing pressure on the national pension, they will also be able to keep their health in good condition, thereby contributing to increased social finances even as they get old.

Table 3. Baby boomers who intend to continue working

	Total	51-55	47-50
Will continue to work as long as health allows	86.7	87.0	86.3
Want to continue to work after 65	63.9	64.2	63.5
Attitude toward the importance of work in old age	91.5	90.9	82.0

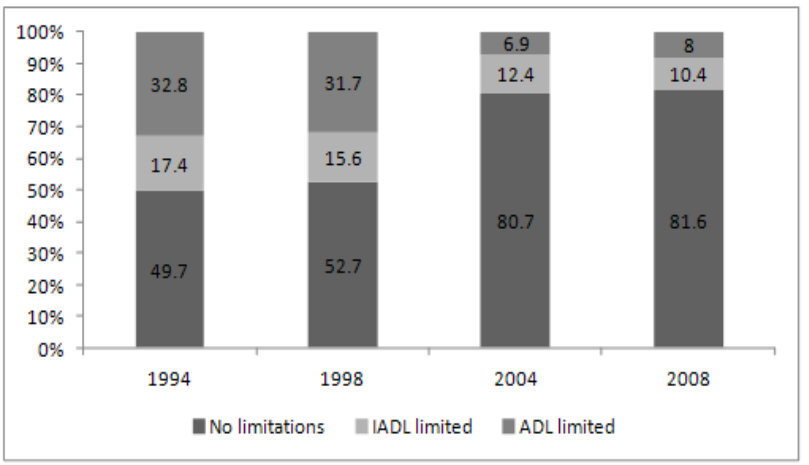
Source: KIHASA (2010), Policy challenges posed by emerging 'new class of older persons'

Social challenges posed by the aging of baby boomers include rising social costs related to health care and long-term care. Currently, baby boomers are mostly in their midlife, and it is not easy to predict how their health conditions will change when they become old. Will they be healthier than the current elderly? As far as illnesses are concerned, there is not likely to be a big change. When comparing prevalence rates among the elderly over the past 14 years, major diseases such as hypertension, diabetes, stroke and cancers have all been on the rise (Lee Yunkyung et al. 2010). While this can partly be explained by the improved access to health care and subsequently easier identification of diseases, it also seems to be the result of the increasingly western eating habits.

But the functional status of the elderly has markedly improved. In 1994, 32.8% of the elderly had limited Activities of Daily Living (ADL), but the number has fallen to 8% in 2008. This indicates that the functional status of the elderly has substantially improved over the past 14 years. Physical functions of the elderly has improved, but their changed housing patterns also seem to have played a role.

While it is not easy to make projections about the health and functional status of baby boomers in their old age, it can be predicted that although their health in the context of health conditions free from illnesses will not greatly improve, their overall functional status will improve.

Figure 9. Functional status changes among the elderly



Up until today, the majority of the elderly needing long-term care have been taken care of by their family members. Long-term care giving was mostly done by family members, such as spouses (48.1%), sons or daughters-in-law (30.9%), and daughters or sons-in-law (9.5%). Care by professional care helpers just comprised 9.1% of long-term care (2008 survey on living conditions of the elderly).

However, long-term care services are expected to be increasingly provided through formal care services rather than through family members. 93.8% of baby boomers intend to use long-term care services for their parents, and 28.7% of baby boomers wanted their spouses and 66.0% wanted formal services for their own care during old age. Therefore, baby boomers are highly likely to rely on formal services if they have no spouses. In other words, while health functions of baby boomers are likely to be in a better shape in their post-retirement days than they are today, less care giving by family members is expected to impose higher burdens on society in the context of long-term care.

B. Ways to have positive scenarios regarding the aging of baby boomers : Ideas to mitigate the impact of the aging of baby boomers on health care finances

Some media call the aging of baby boomers a social crisis or a catastrophe. Will the aging of baby boomers come as a real crisis? Are there ways to make it a more desirable scenario?

In the previous sections, we looked at the worst-case scenario as well as the best-case scenario in the context of health care and long-term care effects on public finances. Let me provide several ideas in order to lessen costs related to the aging of baby boomers. Demographic factors and non-demographic factors are the main drivers of health care costs (OECD, 2006). Demographic factors that affect health care costs include demographic changes, death-related costs and the health status of the population, and non-demographic factors include income effects, advances in medical technology and health care policies. Demographic factors that affect long-term care costs include demographic changes, old-age dependency ratios, health status of the elderly, and non-demographic factors include labor participation, supply of long-term care and income effects. Drivers of rising health care costs over the past 10 years have mainly been advances in medical technology or health care policies, rather than demographic factors.

Long-term care spending has also been influenced primarily by long-term care policies.

Efforts to reduce and effectively utilize national health care costs will offset effects caused by the rapid aging of the population. For this, it is imperative to manage health to extend healthy life expectancy. "Healthy aging" has gained as much attention as cost-containment policies in recent years as a way to mitigate rising health care costs. If health care services have focused on treating illnesses or expensive health services so far, future health care services will need to focus on providing preventive and low-cost health care services. In addition, adoption of the DRG scheme within the current health insurance

system and implementation of dedicated doctors system need to be considered to encourage changes in use patterns of health care services.

In addition, considering the research that prolonged life expectancy is accompanied by longer years spent in good health, healthy life expectancy of baby boomers is likely to be prolonged compared to the current elderly. In the "compression of morbidity" hypothesis, Fries (2000) envisioned that primary prevention and advances in medical technology would postpone the onset of disability in old age, thus compressing the period of disease and disability into a shorter time before death. In fact, between the 1980s and the 1990s, the number of senior people suffering from disabilities steadily declined in most of the developed countries. Evidence of empirical studies conducted by Jacobzone et al. (2000) shows that the level of decline in disability prevalence was significant in Germany, France, Japan and the United States and moderate in Canada and Sweden.

The following suggestions probably need a very careful assessment at this stage. First, private indemnity insurance needs to be reviewed (rising health care costs due to private indemnity insurance). Since its introduction in 2008 in Korea, private indemnity insurance has triggered a visible increase in health care costs. You Chang-hoon et al. (2011) reports that health care use through private indemnity insurance is growing. Whether private providers are meeting the "unmet needs" of the public providers, or whether inappropriate use of health care is growing would need to be determined. The rapid expansion of private indemnity insurance, however, will surely put strains on public health expenditures. Therefore, an in-depth analysis needs to be made to find out the impact of increased use of private indemnity insurance and its coverage on the rising public health expenditures.

Second, hospice care and other systems that restrict the types of end-of-life (life-sustaining) treatment need to be discussed as ways to facilitate reduction in death-related costs. These systems are not just health care issues; they also have ethical

considerations. Although it is difficult to make decisions, these systems still need to be discussed in the context of extending healthy life expectancy, not simply extending life expectancy at birth, in consideration of "dying well."

As the perception of care giving for the elderly changes, long-term care requirements are likely to impose upward burdens on society when baby boomers become senior citizens. Under the current long-term care program, there will be an escalating pressure to expand the scope of long-term care beneficiaries. Currently, only approximately 6% of the elderly receive long-term care benefits, but the number of enrollees is bound to continue to rise given the trends in other countries that adopted the program earlier than Korea. One of the scenarios mentioned earlier projected a marked increase in financing burdens with the percentage of people eligible for long-term care increasing to about 12% of the elderly population.

As a way to lessen the financing burden of long-term care, this author suggests an active utilization of family care. With the introduction of social insurance for long-term care, people began to think of taking care of the elderly who have the right to receive services (with level 1 through 3) as "losing out" on benefits. Korean long-term care only provides in-kind benefits and there are no cash benefits, hence almost no support for family care. For this reason, the number of family members who obtained care helper licenses to receive benefits rapidly grew for the past three years to take care of their parents or spouses (about 50% of home care providers). However, the provision of services by care helpers to their own parents or spouses is generating a number of side effects. For instance, in many cases, high-quality service is not being provided, and the role of long-term care institutions is being hampered. This system is planned to be abolished due to these side effects.

What can be learned from these care-giving patterns is that Korea still has plenty of family resources capable of providing long-term care for the elderly. The reason why the number of family care helpers increased is that there was no mechanism

that ensures equity among the elderly eligible for long-term care between those who use the long-term care services and those who don't (whose care is provided by their family members).

Therefore, finding ways to actively make use of family resources in long-term care will help contribute to stabilizing finances of the long-term care insurance program. To facilitate family care, various methods, such as providing cash benefits or grants for family care, rather than sticking to the current in-kind benefits, will need to be explored.

In recent years, the national health insurance deficit has been an issue in Korea. Stabilization of public finances for long-term care has also been an important topic for discussion. There have been consistent efforts to raise insurance premiums and identify new sources of financial revenues in order to keep public finances for health insurance and long-term care in good shape. However, it is estimated that if the current programs remain unchanged, health care expenditures will continue to rapidly grow due to the expansion of the elderly population in great need of health care services and the rise in expensive health care services. At this moment, therefore, it is necessary to take a more fundamental approach to improving the programs as a way to mitigate the financial burdens to be imposed by the aging of baby boomers.

Finally, ideas provided in this article are purely personal ideas of this author, hence more assessment will be needed to turn these ideas into specific policy considerations. There must also be efforts to obtain a balance between mitigating the rising social care financing burdens and enhancing health security for old age.

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Demographic Changes and Consumption Trends

Eunjung Kim[1)]

Ⅰ. INTRODUCTION

We have noted that over the next several decades, large and unprecedented shifts will occur in the demography of all of the major industrialized countries. These demographic changes will affect the patterns of consumption and its behavior.

Nowadays, the Korean population is characterized by extremely low fertility and a highly aging society. For the last decade, the Korean population has been changed dramatically in terms of both size and structure. Population change has major consequences and implications for every sector in the nation such as the labor market, welfare, economy, and education.

Considering the fact that households' demographic characteristics affect consumption decisions, it has been conjectured that rapid demographic changes will lead to substantial changes in the composition of private consumption expenditure and structure of consumption. Thus, changes in population structure and population composition by age group will have considerable impact on the nation's consumption trends and industry structure. For example, a rapid decrease in the school-age population would lead to a decline in the demand for educational services.

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Furthermore, a huge expansion of the elderly component of the population would bring about increasing demands for healthcare services. The fraction of the population in Korea that is elderly and single family will grow dramatically, while the fraction of the population made up of children will decline. The overall rate of population growth in Korea will become negative. This change can be expected to have large economic effects on the Korean consumption patterns and their behavior.

Many previous research works have tended to focus on (1) the labor force or financial support (social welfare system) for the elderly as the major impact of these demographic changes, and (2) the negative factor of low fertility and an aging society. Few papers have focused on the effect of population and family structure on expenditures for consumption.

In this paper, we describe current trends in fertility and family structure in Korea and review the impact of demographic changes to the consumption trend, and present some implications. The results of the paper can be utilized in forecasting the change in the industrial structure of the economy. In addition, this paper aims to provide baseline materials helpful for further studies and policy planning in consumption-related areas, and to investigate the patterns and changes in the consumption trend in the last decades.

Ⅱ. DEMOGRAPHIC CHANGE IN KOREA

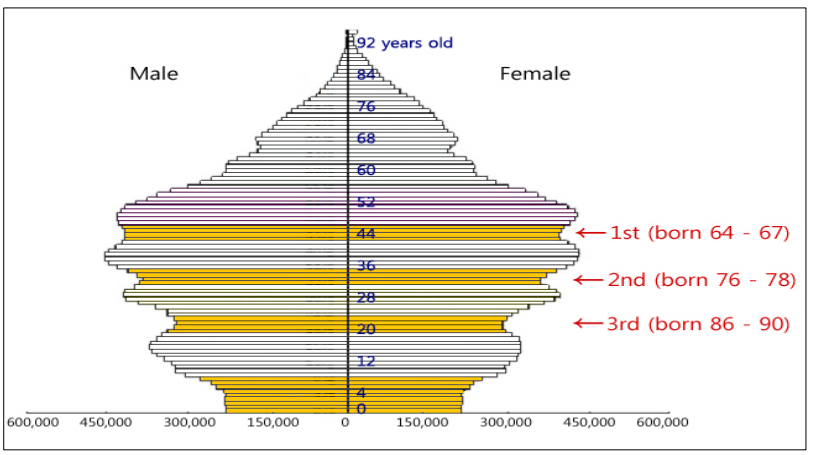
Population Structure and Fertility Trend

This section presents the population structure and family trends in Korea. Figure 1 is a good snapshot of the population structure by age groups. The pyramid shows the rise and decline in the population size among age groups. Korea has experienced three waves of baby busts, including the first baby bust generation born between 1964 and 1967. These age groups ranged from 43

to 46 in 2010. The second baby bust generation is defined by those born between 1976 and 1978. These age groups now range from 32 to 34. The third baby bust is defined by those born between 1986 and 1990. These age groups ranged from 20 to 25 in 2010. Even though in the decade of the 2000s the low number of births is mainly due to low fertility rates, some part of that is due to the previous baby bust generation. There are macroeconomic trends; specific government policies help to explain the baby busts. In addition, part of the decline in fertility was due to economic hardship or a gloomy picture of the country's economic future, which discourages starting a family.

Another socioeconomic trend affecting the baby bust has been rapidly rising levels of educational attainment. It has been found in many earlier studies that education is one of the most important socioeconomic determinants of fertility.

Figure 1. Population Pyramid



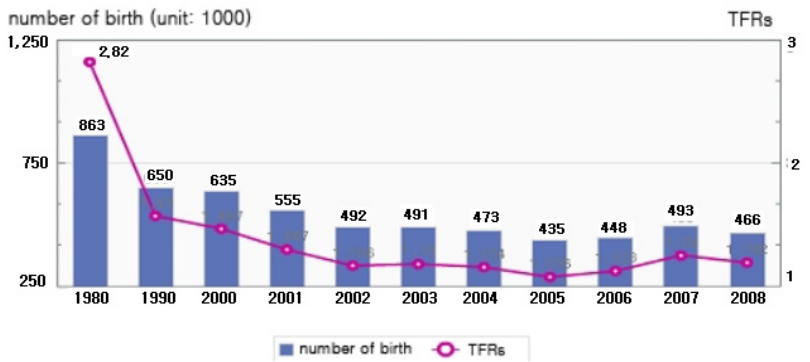
Soruce: Statistics Korea(2010)

The total fertility rate (TFR) sharply dropped from 6.3 births per woman in 1955–1960 to 2.82 births per woman in 1980. The years after 1983 are considered as the second transition period in fertility change.

The TFR gradually fell from 2.82 in 1983 to 1.57 in 1990,

which is far below the 2.1 replacement level. Then it gradually decreased to 1.08 in 2005, which was the lowest fertility rate in the world. In 2007, the TFR increased to 1.25 from 1.12 in 2006, and the number of births increased by 45,000. According to Korean superstition, babies born in that year are believed to be lucky in life, with the result that many couples gave birth in 2007. According to Statistical Korea estimates, the TFRs between 2002 and 2010 are not higher than 1.3.

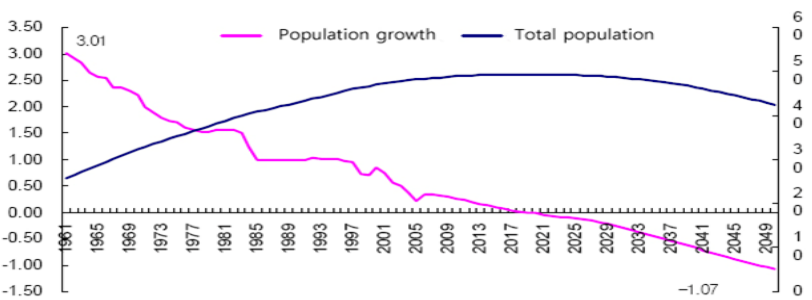
Figure 2. Number of Births and TFRs



Source: Statistics Korea

As long as TFRs below the replacement level the Korean population size will decrease. Figure 3 presents the projections of population growth and size. The population growth has been decreasing after 1960, which is the first year that the population growth has been published.

Figure 3. Population growth and size



Source: Statistics Korea

Household and Family Structure

Families in Korea have been undergoing tremendous changes in structures and patterns. These changes led to changes in consumption trends. Table 1. presents the number of total households and the average number of persons in a household from 1975 to 2005. In 1975 there were about 6.6 million households housing 5.0 persons per household. Three decades later, the households increased to almost 18 million and contained on average 2.9 persons. The decline in household size is attributable to the recent fertility decline. In addition, the number of households has increased at a faster rate than the population growth.

Table 1. Distribution of households by number of household members

	Ordinary households (1,000)	By number of household members (%)						Average number of household members
		One	Two	Three	Four	Five	Six & Over	
1975	6,648	4.2	8.3	12.3	16.1	18.3	40.7	5.0
1980	7,969	4.8	10.5	14.5	20.3	20.0	29.8	4.5
1985	9,571	6.9	12.3	16.5	25.3	19.5	19.5	4.1
1990	11,355	9.0	13.8	19.1	29.5	18.8	9.8	3.7
1995	12,958	12.7	16.9	20.3	31.7	12.9	5.5	3.3
2000	14,312	15.5	19.1	20.9	31.1	10.1	3.3	3.1
2005	15,887	20.0	22.2	20.9	27.0	7.7	2.3	2.9

Source : Statistics Korea

Table 2. presents the population proportion by age of householder. In 2000, the proportion of those who are below 39 years old was 37% and the proportion of those 60 years old and over was 19%. However, within the recent 10 years, each of these has changed to 28% and 25% respectively. These data indicate that the proportion of households with young householders has decreased and the proportion with elderly householders has increased. A low birth rate and population aging have influenced these trends.

Table 2. Population structure by the age of household head

(unit: %)

	Age			
	39 and under	40~49	50~59	60 and over
2000	36.97	26.38	17.53	19.12
2001	35.91	26.77	17.38	19.94
2002	34.78	27.22	17.40	20.60
2003	33.70	27.56	17.54	21.21
2004	32.63	27.53	18.09	21.75
2005	31.52	27.45	18.74	22.30
2006	30.65	27.42	19.18	22.75
2007	29.85	27.08	19.83	23.25
2008	29.06	26.65	20.51	23.78
2009	28.20	26.21	21.27	24.32
2010	27.28	25.81	22.10	24.81

Source: Statistics Korea

Ⅲ. CONSUMPTION TRENDS

Household Expenditure Composition

This paper uses Household Income and Expenditure Survey Data to examine consumption trends. The purpose of this survey is to offer data about current conditions of household income and expenditure. The survey data are used as basic data for computation of the weight on consumer price index and policy making. The data contain information on household income and expenditure in detail. Tables 3 and 4 show household monthly expenditures between 2003 and 2008.

Household expenditure consists of consumption expenditure and non-consumption expenditure. Consumption expenditure consists of 10 consumption items such as food, housing, healthcare, and education. Tables 5 and 6 present the average monthly household expenditures and the proportion of expenditure by the age of householder for each category. Even though the amount of consumption expenditure has increased, the proportion of consumption expenditure has decreased slightly compared to non-consumption expenditures between 2003 and 2010. The proportion of consumption expenditure for housework service, education, and healthcare increased, while the one for food and clothing decreased. In 2008, households spent about $2500 on consumption expenditure and $400 on non-consumption expenditure monthly. In general, healthcare and education expenditures have increased from 4.7% and 11.2% to 5.2% and 12%, respectively. There is not much change in the proportion of each expenditure component in non-consumption expenditure. This paper focuses only on the consumption expenditure, especially expenditures for education and healthcare.

Table 3. Average Monthly household expenditure (household with 2 people and over)

(Unit: Won)

	2003	2004	2005	2006	2007	2008
Expenditure	2,157,248	2,303,275	2,395,077	2,516,678	2,630,904	2,740,680
1. Consumption Expenditure	1,862,338	1,963,316	2,035,256	2,120,122	2,211,615	2,290,398
Food	495,204	532,452	539,260	543,864	555,649	584,828
Housing	62,275	64,627	69,498	73,015	75,160	76,870
Light, Heat, water	93,770	97,477	102,561	106,313	107,765	114,530
Household goods, housework service	71,069	77,928	84,950	88,117	97,330	98,590
Clothing, shoes	101,853	101,523	106,698	111,076	114,603	115,251
Healthcare	88,248	93,705	102,446	110,558	118,734	119,657
Education	208,801	219,833	229,747	241,703	256,386	276,774
Entertainment	89,431	93,918	98,275	100,298	107,760	105,439
Transportation, communication	322,340	339,047	356,166	376,152	385,854	394,402
Etcetera	329,348	342,806	345,656	369,027	392,373	404,058
2. Non-consumption Expenditure	294,910	339,959	359,821	396,556	419,289	450,283
Tax	64,984	73,868	76,321	87,055	97,959	100,682
Public Pension	62,706	67,769	70,794	76,181	77,648	80,494
Social Insurance	50,114	54,444	57,250	61,973	67,809	74,786
Etcetera	117,106	143,880	155,457	171,347	175,873	194,321

Source : Statistics Korea

Table 4. The proportion of monthly household consumption expenditure

-(unit : %)

	2003	2004	2005	2006	2007	2008
Expenditure	100.00	100.00	100.00	100.00	100.00	100.00
1. Consumption Expenditure	86.33	85.24	84.98	84.24	84.06	83.57
Food	26.59	27.12	26.50	25.65	25.12	25.53
Housing	3.34	3.29	3.41	3.44	3.40	3.36
Light, Heat, Water	5.04	4.96	5.04	5.01	4.87	5.00
Household goods, housework service	**3.82**	**3.97**	**4.17**	**4.16**	**4.40**	**4.30**
Clothing, shoes	5.47	5.17	5.24	5.24	5.18	5.03
Healthcare	**4.74**	**4.77**	**5.03**	**5.21**	**5.37**	**5.22**
Education	**11.21**	**11.20**	**11.29**	**11.40**	**11.59**	**12.08**
Entertainment	4.80	4.78	4.83	4.73	4.87	4.60
Transportation, communication	17.31	17.27	17.50	17.74	17.45	17.22
Etcetera	17.68	17.46	16.98	17.41	17.74	17.64
sub total	100	100	100	100	100	100
2. Non-consumption Expenditure	13.67	14.76	15.02	15.76	15.94	16.43
Tax	22.04	21.73	21.21	21.95	23.36	22.36
Public Pension	21.26	19.93	19.67	19.21	18.52	17.88
Social Insurance	16.99	16.01	15.91	15.63	16.17	16.61
Etcetera	39.71	42.32	43.20	43.21	41.95	43.16
sub total	100	100	100	100	100	100

Source : Statistics Korea

Consumption Expenditure by Age of Householder

Table 5 presents the portion of consumption expenditure for each consumption category by age of householder in 2008. The portions of education and healthcare expenditures vary with the age of the householder. Evidently, the education expenditure of households whose heads are aged 30 to 49 is higher than other households. In elderly households, the proportion of healthcare expenditures is much higher than that of other households. In addition, the proportion of expenditures for household goods and housework service is much higher in the group who are under 39 years of age compared with those who are over 40 years of age. In a life cycle, during the period with children under 12, the need for housework increases, including childcare service.

Table 5. Consumption expenditure by age of householder in 2008.

(unit: %)

	Age			
	30~39	40~49	50~59	60 and over
Consumption Expenditure	100.00	100.00	100.00	100.00
Food	24.8	24.8	25.7	29.1
Housing	3.1	3.1	3.7	3.8
Light, Heat, Water	4.7	4.7	5.0	6.7
Household goods, housework service	6.8	3.2	3.4	3.7
Clothing, shoes	5.2	5.1	5.2	4.0
Healthcare	4.9	3.8	5.3	10.0
Education	10.8	19.2	8.2	2.2
Entertainment	5.1	4.3	4.6	4.3
Transportation, communication	18.1	16.5	18.1	15.2
Etcetera	16.5	15.3	20.8	21.1

Table 6 shows the consumption and income variability by age of householder from 2003 to 2008. For those who are aged 60 and over the consumption and income variability is much higher

than that for other age groups, because the stability of income is low for the elderly age group and the ratio of expenditure to income is relatively higher than that of the other groups.

Table 6. Consumption and income variability

	Consumption Variability	Income Variability
39 and under	1.90	1.02
40-49	2.06	1.14
50-59	2.85	1.58
60 and over	4.86	4.06

Source: Statistics Korea

Figure 4 presents the expenditure trend for education between 2003 and 2010 by age of householder. In households whose head is 40 to 49 years old, the proportion of educational expenditure increased from 15% to 21% between 2003 and 2009. In general, the proportion of educational expenditure has increased for all households except elderly households. In Korea, parents are facing higher expenses for their children's private education, which is increasing as their children are growing up until they go to college. Private education spending as the percentage of GDP is much higher than other OECD countries.

Figure 4. Education expenditure trend by age of householder

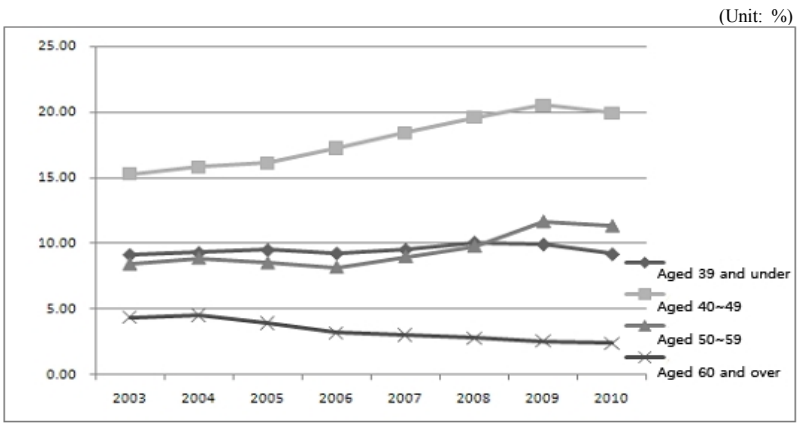
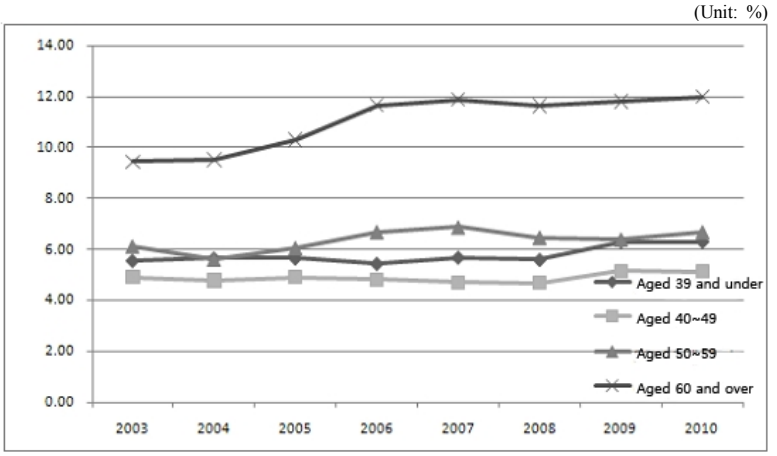


Figure 5 presents the expenditure trend for healthcare between 2003 and 2010 by age of householder. For those aged 60 and over the proportion of healthcare expenditure has increased from 9.5% to 12%. In general, the proportion of healthcare expenditure has increased for elderly households.

Figure 5. Healthcare expenditure trend by age of householder



Consumption Expenditures by Number of Children in a Household

Table 7 shows the proportion of consumption expenditures by number of children in a household in 2010. The survey counts only the number of children who are not married. In households with two children, the proportion of educational expenditure is higher than for other households. For households with no children the proportion of the healthcare spending is higher than for households with kids. The reason is that households without children who are not married are usually elderly who live by themselves.

Table 7. Consumption expenditures by number of children in households in 2010

(unit: %)

	No child	one child	two child
Consumption Expenditure	100	100	100
Food	19.0	15.2	13.7
Clothing, shoes	6.0	6.6	6.4
Housing, Light, Heat, Water	13.3	10.3	8.9
Household goods, housework service	4.1	4.3	3.4
Healthcare	9.9	6.9	5.5
Transportation	11.9	12.9	11.3
Communication	5.8	6.5	5.9
Entertainment	5.3	5.6	5.6
Education	3.1	9.1	18.2
Etcetera	21.58	22.7	21.2

Figure 6 presents the expenditure trend for education between 2003 and 2010 by number of children in a household. The portion of education expenditure by households with two children is almost twice that of households with one child. For households with two children the proportion of educational expenditure decreased in 2010, which is the first decline in several decades. The reason is that our government carried out several policy measures to reduce private educational expenditures.

Figure 6. Education expenditure trend by the number of child in household

(Unit: %)

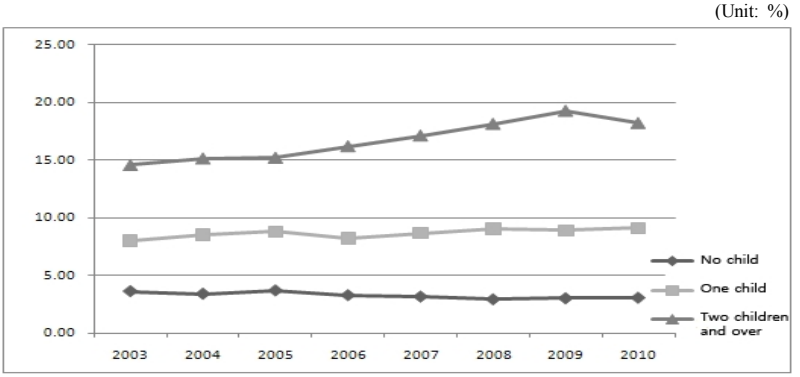
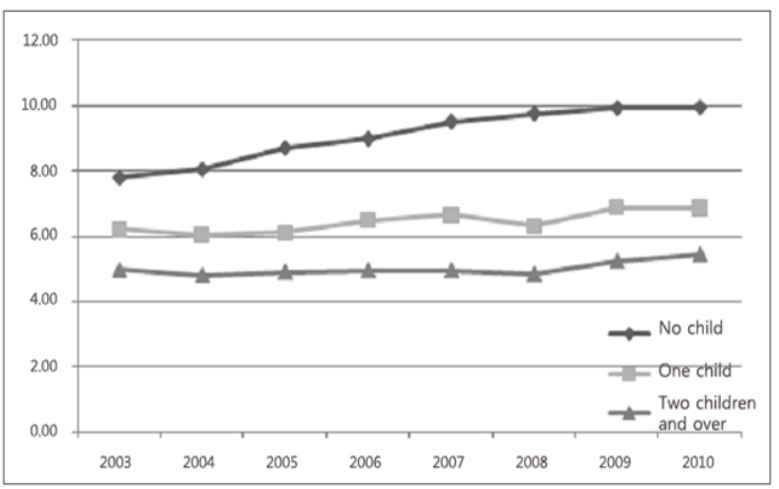


Figure 7 presents the expenditure trend for healthcare between 2003 and 2010 by number of children in a household. The portion of healthcare expenditures by households without children is almost twice that of households with two children. As I mentioned before, the reason is that the households without children who are not married are usually elderly people who live by themselves.

Figure 7. Healthcare expenditure trend by the number of child in household

(Unit: %)



Ⅳ. IMPLICATIONS

The paper aims to review how rapid change in population structure, coming from low birth rates and population aging, will affect changes in consumption. The result is prospects for future increasing spending for education, healthcare, and housework service, but reduced spending for food, clothing, shoes, and other manufactured products. In the future, it seems that changes in population structure will have significant effects, along with improvements in income level.

It is worth noticing that the change in population structure affects future healthcare and education spending. A rise in the proportion of elderly households has an effect on increasing healthcare costs. Therefore, since healthcare costs are considered as a luxury, improvement in income level works as factor to heighten the significance of healthcare costs. As a result, healthcare costs in all households will be expected to grow significantly.

On the other hand, the drop in the population of school age has an effect on reducing educational expenses; however, a positive income effect will offset the negative effects of population structure change. Overall, the educational spending will increase slightly.

Changes in the trend of household income and expenditure will be related to changes in industrial structure. If the supply in the commodity market is flexible enough, the change in demand structure mostly influences the commodity market. Thus, it is recommended to analyze household income components and trends as well as consumption expenditure, along with prospective future consumption and industrial change, as future research. In addition, consumption structure depends on not only demographic changes but also many various factors including income and relative price. For a future comprehensive study, many various factors will require investigation.

Finally, individual consumption patterns are affected by life cycles. Low fertility and rising life expectancy lead to population aging and a decline in the support ratio. People will have incentives to save more and consume relatively less due to their increased life span. Thus, consumption growth will be slower in the future. In addition, the stability of consumption and income has decreased as the age of householders increases. This implies that the government should make more of an effort to maintain sustainable income and consumption levels for the elder

Explaining Trends in Coresidence of Newly Married Couples with Parents in Japan

Rikiya Matsukura[1)]
Robert D. Retherford[2)]
Naohiro Ogawa[3)]

Ⅰ. ABSTRACT

This paper attempts to explain both the long-term downward trend in coresidence of newly married Japanese couples with parents and the surprisingly large and sustained upturn in coresidence precipitated by the 1998 economic crisis. A multivariate analysis shows that the main causes of the long-term decline in coresidence at time of marriage are the declining percentage of marriages that are arranged, rising mean age at marriage for wives, rising levels of education among both husbands and wives, and the declining percentage of couples who grew up in rural areas. The contributions of these variables are partially offset by changes in the mix of couple types, especially the increase in the percentage of couples in which the husband is an eldest son.

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The analysis of the upturn in coresidence precipitated by the 1998 economic crisis reveals a complex interplay between changes in age at first marriage, family structure, and coresidence. Key words: Japan, coresidence, marriage, family structure, 1998 economic crisis

Coresidence of adult children with parents in Japan is of interest not only because of its importance in understanding the structure, functions, and welfare of the Japanese family, but also because of its relevance to government policies relating to population aging and below replacement fertility. The Japanese government views coresidence of middle-aged children with elderly parents as a "latent asset" for caring for the elderly in the context of rapid population aging and escalating costs of the social security system, which in Japan includes universal health coverage as well as pension coverage (Ministry of Health and Welfare 1978; Ogawa and Retherford 1997; Ogawa, Matsukura, and Maliki 2009; Ogawa et al. 2010). The government has so far paid little attention, however, to coresidence earlier in the family life cycle, when many newly married Japanese couples move in with parents, often temporarily. This second type of coresidence can be viewed as a latent asset in the context of the government's efforts to raise Japan's very low fertility, inasmuch as coresidence makes it financially easier for young couples to marry sooner rather than later (Retherford, Ogawa, and Matsukura 2001). It also makes it easier for the young married couple to start having children sooner rather than later, because grandparents can help care for children (Morgan and Hirosima 1983; Hodge and Ogawa 1991).

Whether these two types of coresidence really are latent assets depends on whether one frames the question in terms of coresidence at a particular point in time or in terms of the trend in coresidence. If one considers coresidence at a particular time, then coresidence is clearly a latent asset.

Without it, theis government would have to shoulder even more of the burden of caring for the elderly, marriage would be even less affordable and would occur even later or not at all, and fertility within marriage would be even lower. By contrast, if one considers the trend in coresidence, the direction of the trend makes a difference. If the trend in coresidence is upward, then coresidence is a latent asset. But if the trend is downward, coresidence is a latent liability, because it works against the government's efforts to shift some of the costs of elderly care back to families and to raise marriage and fertility rates.

Among advanced industrial countries, Japan has an unusually high level of coresidence, reflecting the persistence of the traditional norm of the eldest son and his immediate family living with the eldest son's parents. Historically, this pattern arose when Japan was a peasantagrarian society, production was family-based and unspecialized, and father and son typically shared the same occupation, usually farming. Parental authority over children was legitimized and reinforced not only by the legal system but also by the parents' longer experience and greater expertise in their shared work with adult children. Under these circumstances, coresidence of adult children with parents made both economic and social sense (Kendig 1989; Ogawa and Retherford 1997).

Japan's present circumstances are vastly different. In contemporary Japan, the conditions of everyday life that supported values and norms of coresidence in the distant past have mostly disappeared. Values and norms of coresidence are, however, still in the process of adjusting to the modern conditions of everyday life. They have not completely caught up, partly because the conditions of everyday life have continued to change, and partly because, to some extent, values and norms have a life of their own, so that they adjust to changing conditions with a time lag. This lag in adjustment of values and norms is an aspect of the more general phenomenon of cultural lag.

Because the nature of coresidence varies over the family life cycle, the causes of coresidence also vary over the family life cycle.

For example, many newly married couples coreside temporarily with parents because the young couple cannot yet afford to live independently at the standard of living to which they are accustomed. In this situation, the needs of the newly married couple are the paramount consideration governing the decision to coreside. By contrast, when the parents are elderly and their children are middle-aged, many adult children and their immediate family coreside with parents in order to care for the parents when they become frail or sick. In this case the needs of the elderly parents are the paramount consideration governing the decision to coreside. Sorting out the causes of coresidence clearly requires separate consideration of coresidence at time of marriage and coresidence later in the life cycle. This paper focuses on explaining coresidence at time of marriage. Henceforth, unless otherwise indicated, we use the term "coresidence" to mean coresidence at time of first marriage.

In most industrial countries, the proportion of newly married couples who coreside with parents appears to be very low. The data to show this conclusively typically do not exist for other countries, however, the reason being that, as far as we know, national surveys in other countries have never asked a question on coresidence at time of first marriage. In Japan such data exist mainly in the form of a long series of national surveys conducted by the Mainichi Newspapers of Japan, which show that the proportion of newly married couples coresiding with parents at time of marriage fell from 67 percent of marriages in 1955 to a low of 23 percent of marriages in 1997. Then, in response to the economic crisis of 1997-99.conventionally referred to as the 1998 economic crisis. It reversed direction and rose to 29 percent of marriages in 2002 (Ogawa, Retherford, and Matsukura 2008). The principal goal of the present paper is to assess in some detail the causes of both the long-term downward trend of coresidence and the reversal of the trend precipitated by the 1998 economic crisis.

Ⅱ. BACKGROUND

Although the analysis in this paper is based mainly on micro-level survey data, macro-level trends in Japan over the past half-century, having mainly to do with the economy, are also relevant for assessing the causes of the trend in coresidence, including the reversal of the trend between 1998 and 2002. This section summarizes briefly these macro-level trends as they relate to coresidence.

In Japan, the period between the end of World War 2 and the mid-1950s was one of postwar devastation and reconstruction that posed severe hardships on the population. During this period, coresidence, which was often a matter of economic necessity, was the norm. By 1957 the economy had recovered and was growing rapidly. The period 1957.73 was a period of unprecedented prosperity during which per capita real income increased by about 10 percent per year. Mean age at marriage, which had been rising, leveled off and even declined slightly by some measures. Coresidence of newly married couples with parents also declined sharply, not only because of rising prosperity, which made coresidence less necessary, but also because of rapid urbanization, which resulted in many young couples living in cities while parents continued to live in the countryside.

The oil shock of 1973, brought about by the steep rise in the price of oil implemented by OPEC (Organization of Petroleum Exporting Countries), abruptly terminated the period of very rapid economic growth. The oil shock affected Japan more than most other countries, because Japan imports virtually all of its oil. Japan's economy fell into recession, then rebounded three years later to a lower economic growth rate of about 3.4 percent per year. The intervening three year period saw rampant inflation, amounting to 53 percent over the period. Unions fought back and won large wage increases for regular full-time workers. Hard-pressed companies reacted by hiring large numbers of non-union part-time workers at much lower wages and benefits. Most of these part-time workers were

women, many of whom had previously done piece-work at home but now were drawn into production work outside the home. Age at marriage started rising again, and the proportion coresiding at time of marriage declined more slowly than before (Retherford and Ogawa 2006; Ogawa, Retherford, and Matsukura 2008).

Economic boom times resumed during the "bubble economy" of the second half of the 1980s. Despite the steep rise in land and home prices during this period, the decline of coresidence accelerated, conforming to a general tendency of coresidence to fall during good times and rise during hard times. In late 1989 the stock market peaked and started to fall, and by 1993 the country had fallen into recession (Yoshikawa 2001). Nevertheless, for several years the expectation was that the good times would return soon (Yoshikawa 2001; Ogawa 2005). Many marriages were accordingly postponed, but among those who did marry, coresidence continued to decline. The Japanese government reacted to the economic slump by pumping money into public works projects. This effort to jump-start the economy was largely unsuccessful and resulted in a massive increase in government debt. It became increasingly evident that what was required was a major restructuring of the economy in order to make it more competitive in the rapidly globalizing world economy. Restructuring commenced in the mid-1990s but proceeded slowly, with the result that the economy stagnated during most of the 1990s until about 2002.a period often referred to as "Japan's lost decade".

For one or two years after 1995 the economy seemed to be recovering but was still weak, with banks still carrying huge amounts of bad debt. An ill-timed increase in the national consumption tax (sales tax) precipitated a stock market collapse in 1998 and tipped the economy back into recession.

The period of the 1998 economic crisis (1997-99) was a period of considerable social instability, characterized by increases in unemployment, suicide, crime, child abuse, and dropping out of high school (Yamada 2004).

When the economy fell back into recession, many older

unmarried couples who had been postponing marriage for years finally gave up on waiting for the good times to return, got married, started having children, and coresided in order to afford getting married and having children. This contributed to the reversal of the trend in coresidence after 1998 and also led to a bunching of first births, as indicated by an increase in the period parity progression ratio from first marriage to first birth (Ogawa, Retherford, and Matsukura 2008).

Ⅲ. DATA AND METHODS

The analysis is based on a series of national surveys, described in more detail below. A preliminary period analysis of the trend in coresidence over these surveys, in which the time dimension of the trend was year of survey, yielded inconclusive results. A marriage cohort analysis of the trend in coresidence proved to be much more revealing.

The marriage cohort analysis is based on individual-level survey data for married women age 16-49 who were still in their first marriage at time of observation. The data are from the 1981, 1984, 1986, 1988, 1990, 1992, 1994, 1996, 1998, and 2000 rounds of the National Survey on Family Planning (NSFP) and the 2004 National Survey on Population, Families, and Generations (NSPFG), all conducted by the Mainichi Newspapers of Japan. For purposes of analysis, the data from these surveys were pooled. In some parts of the analysis, the pooled data set also includes the 2007 National Survey on Work and Family (NSWF), conducted by the Nihon University Population Research Institute. Although the 2007 survey includes information on year of first marriage, it does not include information on coresidence at time of first marriage, which greatly limits its usefulness in the analysis. All of the surveys include respondents age 16- 49. The 1981, 1984, 1986, 1988, and 1992 surveys include only currently married women. The subsequent surveys include all women, regardless of marital status. Sample sizes vary somewhat

irregularly from one survey to the next, ranging from 2,391 in the 1992 survey to 3,769 in the 1990 survey. With two minor exceptions, the response rate declines regularly from one survey to the next, from 82 percent in the 1981 survey to 61 percent in the 2004 survey. In the 2007 survey the response rate was even lower at 51 percent. The non-response may be selective by marital status and other characteristics (in particular, single persons may be under-represented). To the extent that selectivity exists, it may bias some of the results reported below. Underrepresentation of single persons is not a problem, however, because the analysis focuses on currently married women still in an intact first marriage at time of survey.

The basic data set is pooled over all eleven surveys (not including the 2007 survey) that contain information on both year of marriage and coresidence at time of marriage. Because some surveys are missing some predictor variables, however, some parts of the analysis are based on smaller pooled samples over a smaller number of surveys. Apart from omissions at the level of entire surveys, within-survey cases with missing information on one or more of the variables are rare; these cases are, of course, also omitted from the pooled data set in those parts of the analysis that include those variables. The multivariate analysis is based on seven of the eleven surveys. All women in the 1981, 1984, 1988, 1990, and 2007 surveys are excluded from the pooled data set for the multivariate analysis because each of these surveys did not ask at least one of the questions needed to construct the full set of variables.

As used in this paper, the term “newly married” refers to first marriages. Prior to the 1992 survey round, however, the NSFP did not distinguish between first marriages and remarriages. We treat current marriages recorded in the pre-1992 surveys as if they were first marriages, except for women with children born before the woman’s reported age at marriage. These women are assumed to be in a second or subsequent marriage and are excluded from the analysis. The treatment of current marriages as first marriages in the pre-1992 surveys leads to some bias in

the results, but this bias is probably small, because remarriages were uncommon prior to 1992 (Hodge and Ogawa 1991). Henceforth, in the interest of economy of language, we shall refer to first marriages simply as marriages.

The analysis comprises both a multivariate analysis and an analysis based on simple graphs of trends of coresidence and related variables in subgroups defined by demographic and socioeconomic characteristics. In the simple graphical analysis, the graphs define marriage cohorts by single calendar years of marriage (actually three-year moving averages of single calendar years) as far back as 1958 and as recently as 2004, depending on which surveys are included in the underlying pooled data set on which a particular graph is based. The multivariate analysis includes several predictor variables in the same statistical model and, as already mentioned, is based on a smaller pooled data set. In the multivariate analysis, marriage cohorts are defined as 5-year groupings of year of marriage, ranging from 1960-64 to 2000-04, in order to have a sufficient number of cases for each marriage cohort. The multivariate analysis is based on logistic regression.

Most respondent characteristics asked about in the surveys pertain to time of survey, not time of marriage. Some characteristics, however, do pertain to time of marriage, and some others, such as education, almost always pertain to time of marriage as well as time of survey, because, in Japan, very few people go on for more education after marrying. The analysis, being a marriage cohort analysis, requires that predictor variables pertain to time of marriage.

The predictor variables that we consider in the multivariate analysis are marriage type (arranged, love), wife's pregnancy status at time of marriage (pregnant, not pregnant), wife's age at marriage (<24, 25-29, 30-34, 35+), husband's age at marriage (<24, 25-29, 30-34, 35+), couple type (eldest son and eldest daughter, eldest son and younger daughter, younger son and eldest daughter, younger son and younger daughter), childhood residence (urban, rural), wife's education (junior high or senior high, junior college, university), husband's education (junior high

or senior high, junior college, university), and wife's work experience before marriage (fulltime for pay, part-time for pay, did not work for pay). Regarding measurement of pregnancy status at time of marriage, a woman was assumed to be pregnant if she had her first child within the first eight months of marriage. The relevance of these variables to coresidence will be clarified in the course of the analysis.

Although the analysis is primarily a marriage cohort analysis, it recognizes that some single persons are more likely to be selected into marriage than others. For example, those who marry may be selected on characteristics such as education or employment status. The remaining sub-population of single persons is then reverse-selected on the same characteristics. Selection into marriage helps explain the anomalous finding that coresidence continued to decline during the post-bubble period of economic decline and stagnation between 1990 and 1998, reversing the usual pattern whereby coresidence increases during hard times. It appears that the likelihood of selection into marriage during the period 1990-98 was greater for women with secure jobs (regular full-time workers) than for women with insecure jobs (part-time workers) or no job. Women with secure jobs (or thought to be secure jobs) were relatively insulated from the economic downturn, and among them coresidence continued to decline. By contrast, it appears that those with insecure jobs or no job tended to postpone marriages during this period, in the hope that good economic times would return soon. When the economy dipped back into recession in 1998, such hopes were finally dashed, and a new dynamic emerged, as will be explained in more detail below, following the multivariate analysis of the long-term downward trend in coresidence. Women in earlier marriage cohorts (i.e., women who married long before the survey but were still in an intact marriage at time of survey) are more selected for not having experienced divorce or widowhood in the years following marriage than are women in later marriage cohorts (i.e., women who married shortly before the survey, who have not yet had

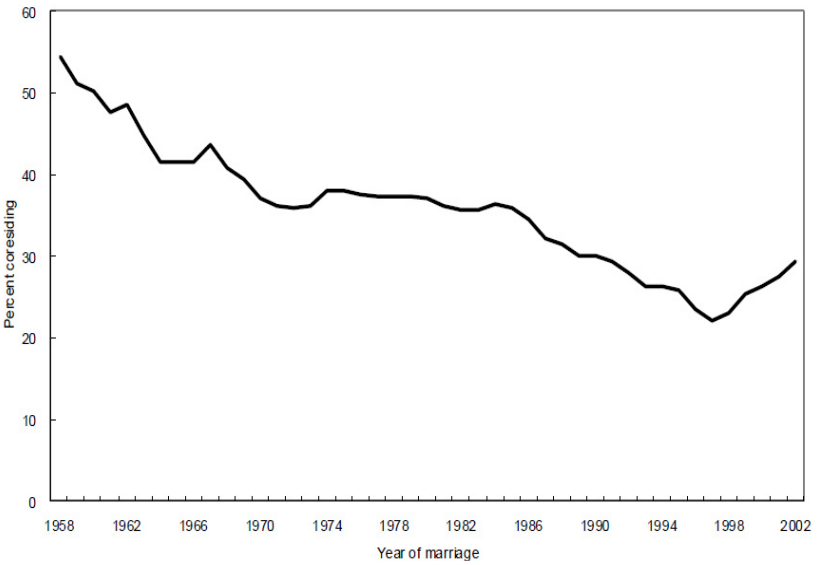
much exposure to the risk of divorce or widowhood). Because of Japan's very low mortality and the fact that women's ages range from 15 to 49, the risk of divorce is a more important consideration than the risk of widowhood. The analysis assumes that the probability of coresiding at time of marriage is independent (or nearly so) of the probability of subsequent divorce or widowhood, but our data do not allow a test of this assumption. Selection that varies by marriage duration may also occur on other characteristics. Because of possible selection bias, the percentages coresiding presented in this paper must be viewed as approximate. They must be viewed as approximate also because of a possible non-response bias.

Ⅳ. MULTIVARIATE ANALYSIS

Figure 1 shows the basic trend in coresidence that we wish to explain. In this graph, the most recent marriage cohorts tend to be smaller because, in the pooled data set comprising many surveys, these cohorts draw women only from the most recent survey. Earlier cohorts draw women from more than one survey. A value for a particular year of marriage is plotted only if the number of marriages in that year is at least 20, and if a 3-year moving average can be calculated for that year.

Figure 1 shows that the long-term trend in coresidence is downward. Between the late 1960s and mid-1980s, however, the trend mostly leveled off, not only because of the oil shock of 1973 and slower economic growth, but also because of the doubling of the availability of parents to a newly married couple, caused by the sharp decline in number of children of marriageable age per couple in the parental generation, as a consequence of rapid fertility decline in earlier years, especially in the 1950s (Hirosima 1991).

Figure 1. Trend in coresidence of newly married couples with parents by year of marriage



The generally downward coresidence trend is also characterized by temporary fluctuations in response to short-term ups and downs in the state of the economy. Coresidence tends to fall when the economy is doing well and to level off or rise when it is not doing well. Figure 1 shows, for example, that coresidence rose temporarily during the recession that occurred around 1965 and again following the major oil shock of 1973 and the smaller oil shock of the early 1980s. It fell during the bubble economy of the late 1980s. As mentioned earlier, however, it continued to fall during the 1990s as the bubble economy collapsed and Japan entered its lost decade, reversing direction only in 1998.

The multivariate analysis in this section sheds additional light on the causes of the trend. As already discussed, the multivariate analysis is based on pooled data from seven of the eleven surveys that include a question on coresidence at time of marriage. The pooled data set for the multivariate analysis is therefore much smaller than the pooled data set on which Figure 1 is based. A consequence of the exclusion of four

surveys from the pooled data set is that, as will be seen shortly, the downward trend in coresidence calculated from the data set used for the multivariate analysis is not quite as steep as the downward trend in coresidence shown in Figure 1. The response variable in the logistic regressions (one regression for each 5-year marriage cohort) is coresidence at time of marriage. In the regression equation, this is a predicted probability of coresidence, but at the individual woman level, coresidence is a dichotomous yesor-no variable. The predictor variables are all categorical variables, as shown in Tables 1 and 2.

Table 1. Percentaged distribution of each 5-year marriage cohort on the predictor variables

	Year of marriage								
	1960-64	1965-69	1970-74	1975-79	1980-84	1985-89	1990-94	1995-99	2000-04
Marriage form									
Arranged	50	49	34	33	26	21	13	11	3
Love	50	51	66	67	74	79	87	89	97
Wife pregnant at time of marriage									
Yes	4	5	9	12	15	19	20	21	22
No	96	95	91	88	85	81	80	79	78
Wife's age at marriage									
<25	87	83	79	64	54	44	40	30	31
25-29	13	16	19	32	36	42	41	43	35
30-34	0	1	1	2	6	8	12	15	19
35+	0	0	1	2	4	5	7	13	16
Husband's age at marriage									
<25	35	34	40	33	29	28	28	25	23
25-29	56	55	48	49	42	39	39	37	39
30-34	10	11	10	15	23	22	22	23	26
35+	0	1	1	3	5	10	10	14	12
Couple type									
Eldest son & eldest daughter	21	22	22	26	34	43	46	49	46
Eldest son & younger daughter	24	23	24	24	22	22	22	19	21
Younger son & eldest daughter	26	26	26	26	26	23	21	21	20
Younger son & younger daughter	30	29	28	25	18	12	10	10	13
Childhood residence									
Urban	39	47	51	53	60	68	77	76	81
Rural	61	53	49	47	40	32	23	24	19
Husband's education									
Jr. high or sr. high	81	76	66	61	53	49	47	46	46
Jr. college	5	4	8	9	11	12	14	16	21
University	14	20	26	29	36	39	39	38	32
Wife's education									
Jr. high or sr. high	89	86	75	68	57	51	49	42	43
Jr. college	8	12	20	25	31	37	40	42	42
University	3	2	5	8	12	12	10	16	15
Wife's work status before marriage									
Worked for pay full time before marriage	60	73	80	83	84	86	87	83	80
Worked for pay part time before marriage	2	2	2	4	4	5	5	8	14
Did not work for pay before marriage	38	25	18	13	12	9	8	10	5

Trends in population composition by each predictor variable are shown in Table 1. (For any given predictor variable, "population composition" is defined here as the set of proportions of women in each variable category.) Regarding broad trends over the entire estimation period 1960-64 to 2000-04, Table 1 shows that the proportion of marriages that were love marriages increased greatly over time; the proportion of wives who were pregnant at time of marriage increased greatly over time; the proportions marrying at older ages increased greatly over time for both wives and husbands; the proportions of couples in which the husband was an eldest son and the wife was an eldest daughter increased greatly over time; the proportion of couples in which wife's childhood residence was urban increased greatly over time; the proportion of couples in which husbands and wives had higher education increased greatly over time; and the proportion of couples in which the wife worked for pay before marriage increased greatly over time (within the worked-for-pay category, however, full-time went down sharply and part-time went up sharply after 1990-94).

A preliminary analysis (simple percentages not predicted from regressions) showed that the percentage coresiding at time of marriage tends to be lower for love marriages than for arranged marriages, lower for those marrying at older ages, lower for those with more education, and lower for couples in which the wife's childhood residence was urban. These coresidence differentials, together with the compositional changes for these same variables as shown in Table 1 and described in the preceding paragraph, suggest that compositional changes by marriage type, age at marriage, education, and childhood residence all help to explain the observed downward trend in coresidence; i.e., if composition by these variables had not changed, the trend in coresidence would have been less steeply downward. By contrast, coresidence tends to be higher for couples in which the husband is an eldest son, and higher for couples in which the wife was already pregnant at time of marriage.

In this case, compositional changes by couple type and pregnancy status do not help to explain the observed downward trend in coresidence. On the contrary, the compositional changes by these two variables (increase in the proportion of grooms who are eldest sons and increase in the proportion of women who were pregnant at time of marriage) have tended to slow the decline of coresidence; i.e., if composition by these two variables had not changed, the downward trend in coresidence would have been even steeper.

Based on this preliminary bivariate analysis, we grouped the predictor variables into two groups: (1) predictor variables for which compositional changes have tended to contribute to the decline in coresidence, and (2) predictor variables for which compositional changes have tended to offset the decline in coresidence. Controlling for compositional change in the first group of variables tends to explain (i.e., flatten) the trend in coresidence, and controlling for compositional change in the second group of variables tends to make the trend in coresidence more steeply downward. Predictor variables in the "explains" group include marriage type, wife's age at marriage, childhood residence, husband's education, wife's education, and wife worked for pay before marriage. Predictor variables in the "offsets" group include husband's age at marriage, couple type, and wife pregnant at time of marriage. (Husband's age at marriage was moved to the "offsets" group because it has a slightly offsetting effect once wife's age at marriage and other variables are controlled.)

Principal results from the multivariate analysis are presented in Table 2 and Figure 2 and 3. In Table 2, a separate logistic regression model is fitted to each 5-year marriage cohort, with all of the above-mentioned predictor variables included in the model. The predictor variables are all categorical variables, each specified by a set of j-1 dummy variables representing j categories, with the reference category indicated by a dagger symbol in the row headings of the table.

The numerical entries for variable categories in the table are model-predicted percentages coresiding. For example, in the case of the 1960-64 marriage cohort, predicted percentages coresiding for arranged and love marriages (52 and 36 percent) are calculated by alternatively substituting 1 and 0 for the dummy variable representing arranged marriage while holding the dummy variables representing the other predictor variables constant at their mean values for women in the 1960-64 marriage cohort. This substitution yields predicted probabilities of coresidence that are expressed as percentages in the table. In the approach illustrated by this example, the predicted percentages coresiding for categories of any one of the predictor variables control for population composition by each of the other predictor variables. (Note that the mean of the dummy variable representing a category of any particular predictor variable is simply the proportion of women in the marriage cohort who are in that category. The proportion in the reference category of the variable is calculated as one minus the sum of the proportions in the other categories of the variable. It follows that holding the dummy variables representing categories of a predictor variable constant at their mean values is equivalent to holding the proportion in each variable category constant. Recall from the discussion of Table 1 that the set of such proportions for any given predictor variable is what is meant by population composition by that variable.)

The method for calculating the three trends (observed, unadjusted, and adjusted) in the three penultimate rows of Table 2 and in Figure 2 is the following: In the case of the observed trend, the percentage coresiding is calculated directly as a simple percentage for each of the nine marriage cohorts of 1960-64, 1965-69, ..., 2000-2004. The other two trends, labeled unadjusted and adjusted, are model-predicted trends in coresidence. In the case of these two trends, predicted percentages coresiding are calculated from the nine separate underlying logistic regressions, one for each of the nine marriage cohorts for 1960-64, ⋯, 2000-04.

Table 2. Model-predicted percentages of newly married couples coresiding with parents

	1960-64	1965-69	1970-74	1975-79	1980-84	1985-89	1990-94	1995-99	2000-04
Marriage form									
Arranged	52 **	48 **	44 **	52 **	51 **	40 **	37 **	27	11
Love †	36	31	27	32	31	27	22	19	25
Wife pregnant at time of marriage									
Yes	35	39	32	38 *	35	33 **	29 **	32 **	32
No †	37	30	27	32	31	26	21	17	23
Wife's age at marriage									
<25	40	37 *	36	36 **	38 *	29	24	26 *	26
25-29	27	25 **	29	31	30	29	23	24	24
30-34	44	20	13	31	27	22	19	11	35
35+ †	44	45	32	34	33	27	25	18	20
Husband's age at marriage									
<25	40	34	32	40	27	23	22	24	47
25-29	31	31	27	34	34	25	21	17	17
30-34	47	27	26	29	30	30	25	17	18
35+ †	38	35	28	33	32	29	24	23	36
Couple type									
Eldest son & eldest daughter	46 **	43 **	37 **	41 **	39 **	33 **	27 **	28 **	22
Eldest son & younger daughter	52 **	40 **	35 **	43 **	39 **	32 **	26 **	19 *	27
Younger son & eldest daughter	18	16	15	20	21	20	18	12	23
Younger son & younger daughter †	19	14	14	18	18	16	15	10	35
Childhood residence									
Urban	36	31	27 **	31 **	31 **	25 **	22 **	18 **	21
Rural †	40	36	32	40	36	37	29	27	41
Husband's education									
Jr. high or Sr. high †	39	35	31	38	35	28	28	24	29
Jr. college	48	37	32	37	32	32	23	22	24
University	28	24 **	21 **	25 **	27 **	23 **	17 **	13 **	19
Wife's education									
Jr. high or Sr. high †	39	38	31	34	35	30	29	22	30
Jr. college	31	27 *	28 **	33	31 *	27	21 **	18	23
University	49	27	17 **	31	26 **	20 **	14 **	18	17
Wife's work status before marriage									
Worked for pay full time before marriage	39 **	31	27	33 *	31	29	23	20	26
Worked for pay part time before marriage	20 *	34	27	29	36	19 *	20	16	20
Did not work for pay before marriage †	56	36	34	39	33	29	27	18	26
Observed trend	49	44	40	41	37	33	27	25	28
Unadjusted trend (marriage cohort-specific means)	49	43	38	40	36	32	26	21	25
Adjusted trend (overall pooled sample means)	40	36	35	39	37	33	29	24	27
N	335	880	2023	2166	2332	1848	1569	767	205

See text for explanation of how this table was calculated.

A predicted percentage coresiding for any particular marriage cohort is calculated by substituting a set of mean values of the predictor variables into the fitted logistic regression equation for that marriage cohort. The equation is then solved for the proportion coresiding P, which is expressed as a percentage in Table 2 and Figure 2.

In calculating the unadjusted and adjusted trends, the same nine fitted logistic regression equations are used regardless of which of these two trends is considered. The set of mean values of the predictor variables, however, differs between the two trends. In the unadjusted trend, marriage cohort-specific means of the predictor variables are used. Thus, in the unadjusted trend, population composition is not held constant from one marriage cohort to the next. By contrast, in the adjusted trend, the same set of means of the predictor variables in the pooled sample is used for every marriage cohort. Thus the adjusted trend controls for (holds constant) population composition across marriage cohorts. In this approach to controlling for changes in population composition, effects of predictor variables, as measured by the estimated coefficients of those variables, are allowed to vary from one marriage cohort to the next while population composition is held constant from one marriage cohort to the next.

Figure 2. Observed, unadjusted, and adjusted trends in coresidence of newly married couples with parents

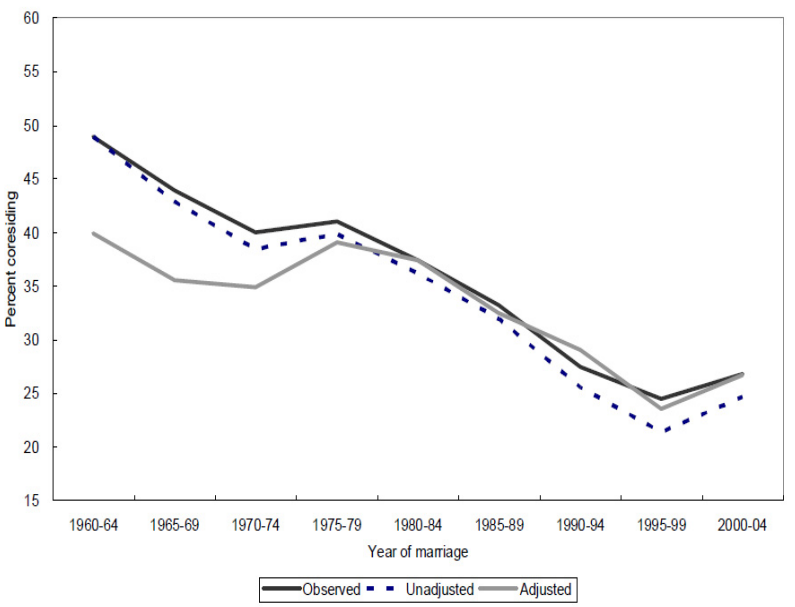
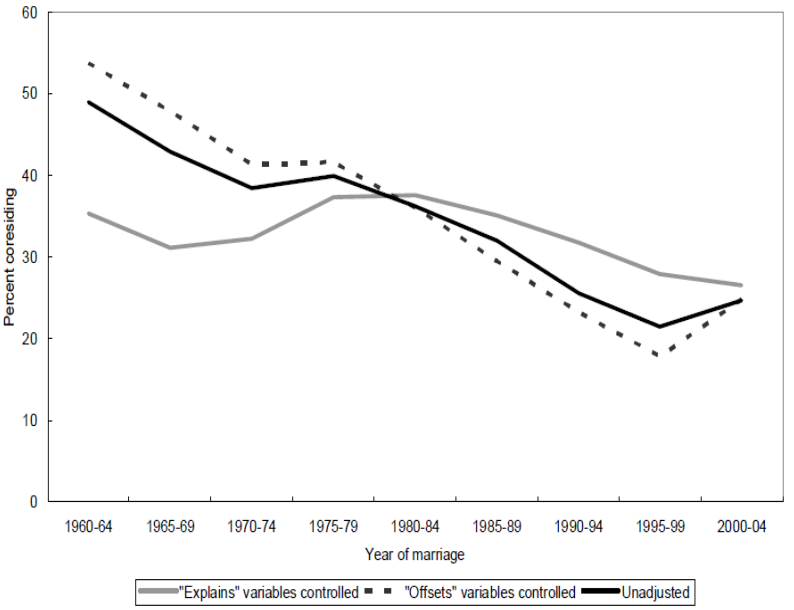


Figure 2 shows that, as expected, the observed and unadjusted trends coincide fairly closely, although somewhat less closely for more recent cohorts. Comparison of the unadjusted and adjusted trends indicates the extent to which changes in population composition by the predictor variables explain the unadjusted trend. If the adjusted trend were found to be perfectly flat (same percentage coresiding for every marriage cohort), then changes in population composition by the predictor variables would completely explain the trend. In Figure 2 the adjusted trend is indeed flatter than the unadjusted trend, but by no means completely flat. If we consider just the first and last marriage cohorts, changes in population composition account for 46 percent of the unadjusted downward trend. It is also noteworthy that, when compositional changes in the predictor variables are controlled, the predictor variables collectively do not explain the upturn in coresidence in either 1975-79, following the 1973 oil shock, or 2000-04, following the 1998 economic crisis.

We also computed two partially adjusted trends by selectively re-setting the marriage cohort-specific means to pooled means, first for the "explains" variables considered as a group (leaving the means for the "offsets" variables at their marriage cohort-specific values) and second for the "offsets" variables considered as a group (leaving the means for the "explains" variables at their marriage cohort-specific values). Results are shown in Figure 3. The curve with "explains" but not "offsets" variables controlled is considerably flatter than the adjusted curve in Figure 2. Changes in population composition by the "explains" variables now account for 64 percent of the downward unadjusted trend.

Figure 3. Trends in coresidence of newly married couples with parents, computed three different ways: (1) original unadjusted trend, (2) partially adjusted trend with the "explains" variables re-set to their means in the pooled sample, and (3) partially adjusted trend with the "offsets" variables re-set to their means in the pooled sample



Further analysis (not shown), based on substituting a pooled mean for a marriage cohort specific mean for one predictor variable at a time, indicates that no one of the "explains" variables stands out in terms of accounting for the flattening of the unadjusted curve in Figure 3. By contrast, among the "offsets" variables, change in population composition by couple type accounts for almost all of the additional downward steepening of the unadjusted curve. The offsetting effect of couple type stems mainly from the long-term increase in the proportion of couples in which the husband is an eldest son. Figure 3 also shows that controlling for changes in composition by the "explains" variables eliminates the upturn in coresidence between 1995-99 and 2000-04. By contrast, controlling for changes in composition by the "offsets" variables results in the upturn becoming even steeper. (For reasons that are not clear, however, the opposite is true for the upturn in coresidence between 1970-74 and 1975-79.)

Ⅴ. FURTHER ANALYSIS OF THE UPTURN OF CORESIDENCE AFTER 1998

It is of interest to explore further the causes of the anomalous continued decline of coresidence following the bursting of the bubble economy in late 1989 and the surprisingly large and sustained upturn in coresidence after 1998. A simple graphical analysis (not multivariate) turns out to be instructive. In the graphs, percentages plotted on the vertical axis are observed percentages, not model-predicted percentages. For any given graph, the underlying pooled data set on which percentages are based is usually larger than the pooled data set used in he earlier multivariate analysis, because it is no longer necessary that a survey include all of he predictor variables used in the multivariate analysis in order to be included in the pooled data set for the particular graph under consideration. It is necessary only that a survey includes the two variables indicated on the horizontal and vertical axes of the graph. Because sample sizes are larger, it is usually possible in the graphs to indicate single-year marriage cohorts (actually 3-year moving averages of single-year marriage cohorts) instead of 5-year marriage cohorts. The finer detail provided by single-year marriage cohorts turns out to be important in understanding coresidence dynamics after 1998.

The multivariate analysis in the preceding section indicated that marriage-related variables are prominent within the “explains” group of predictor variables. A logical next step is therefore to look at the trends in the marriage-related variables in more detail. Because of space limitations, it is not feasible to present graphs of these trends for all of marriage-related variables.

Figure 4 shows the trend in mean age at first marriage (MAM), which is shown separately for men and women.

When compared with Figure 1, Figure 4 shows that, over the long term, MAM is negatively associated with coresidence over marriage cohorts. The older the age at which people marry, the less likely they are to coreside with parents when they do marry, and conversely after 1998 when MAM declined and coresidence increased. (Official statistics do not show a decline in MAM after 1998. This seeming inconsistency may occur at least in part because we consider only those newly married women who, at time of survey, were still in an intact first marriage. Women who divorced or became widows between time of marriage and time of survey are excluded. Moreover, the extent of exclusion increases as the gap between time of marriage and time of survey increases. Selective non-response in one or more of the 2000, 2004, and 2007 surveys may also play a role in explaining this inconsistency.)

Figure 4. Trends in mean age at marriage for husbands and wives

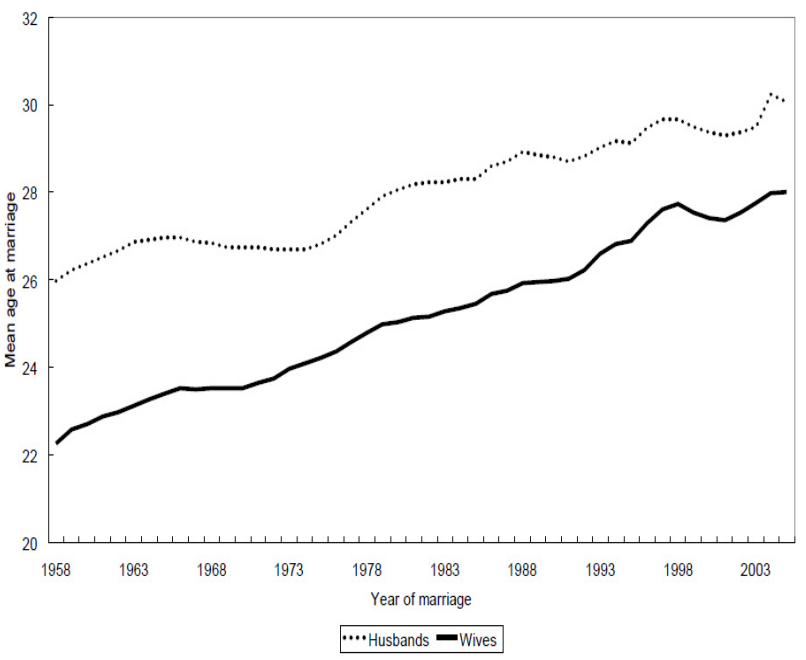


Figure 4 also indicates that MAM is slightly more sensitive to the ups and downs of the economy for men than for women. This is not surprising, given that the husband in a newly married couple is usually the primary breadwinner.

To a considerable extent, both coresidence and MAM are influenced by the state of the economy. But MAM is influenced by many noneconomic factors as well (Retherford, Ogawa and Matsukura 2001; Retherford and Ogawa 2006), so that one expects MAM to have effects on coresidence that are to some extent independent of the effects of economic trends and fluctuations. Surprisingly, MAM fell for about three years after 1998, the reverse of the usual pattern whereby MAM increases in the short term in response to hard times. The fall in MAM may have occurred partly because the insecure part-time workers who tended to postpone marriage prior to 1998 before giving up and getting married after 1998 tended to be younger workers, among whom part-time work was more prevalent.

Further insight into the rise of coresidence after 1998 is gained by examining how the 1998 economic crisis affected marriages of eldest sons and younger sons. As shown in Figure 5, the proportion of marriages in which the husband is an eldest son rose until 1998, after which it fell until 2003, then resumed rising during 2004 and 2005. The fall in this proportion between 1998 and 2003 suggests that marriages of younger sons account for a disproportionate share of the temporary decline in MAM after 1998 in Figure 4. Evidence supporting this inference is provided by the upper two curves in Figure 6, which show that after 1998 MAM continued to rise for eldest sons but fell sharply for younger sons. The graph also shows that, starting around 1980 and continuing until 1998, MAM increased for both eldest sons and younger sons, with younger sons marrying somewhat later than eldest sons. After 1998 the pattern reversed, with younger sons marrying earlier than eldest sons. The lower two curves in Figure 6 show that a similar reversal occurred for wives of eldest sons and wives of younger sons.

Figure 5. Trend in the proportion of husbands who are eldest sons

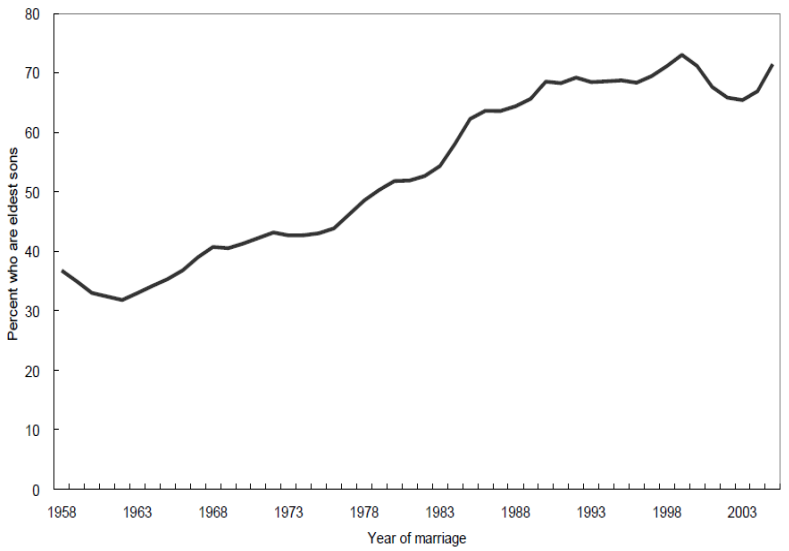


Figure 6. Trends in mean age at marriage for husbands and wives by whether the husband is an eldest son or a younger son

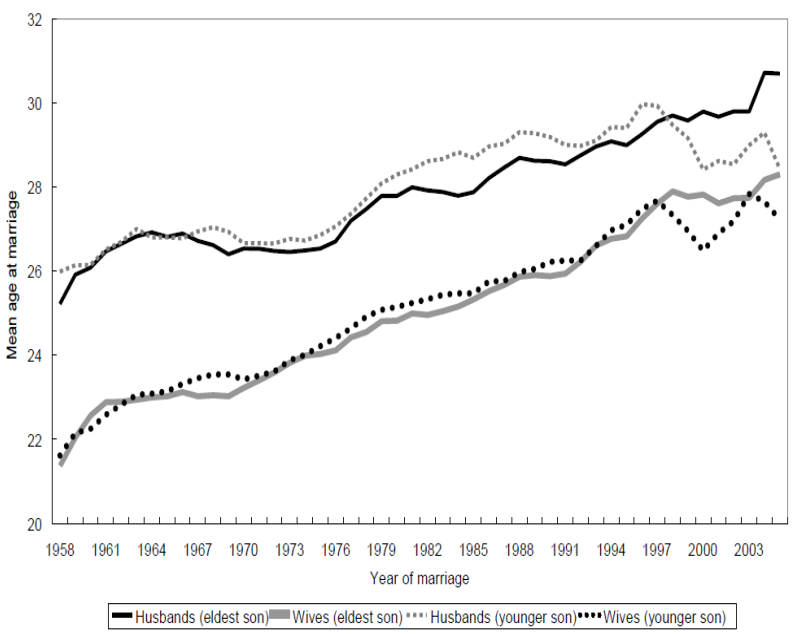


Figure 7 shows further that after 1998 coresidence rose sharply for couples in which the husband was a younger son, while coresidence stopped declining and leveled off for couples in which the husband was an eldest son. The likely reason for this difference is that newly married eldest sons found it difficult to coreside with parents if a younger son was still in the parental household. By the time a younger son got married, however, the eldest son was likely to be living elsewhere, in which case it was relatively easy for a newly married younger son to coreside with his parents. The lower opportunity of coresidence for husbands who were eldest sons than for husbands who were younger sons helps explain why MAM continued to increase after 1998 for husbands who were eldest sons (albeit more slowly than before 1998) while it declined sharply for husbands who were younger sons.

Figure 7. Trends in coresidence of newly married couples with parents by whether the husband is an eldest son or a younger son

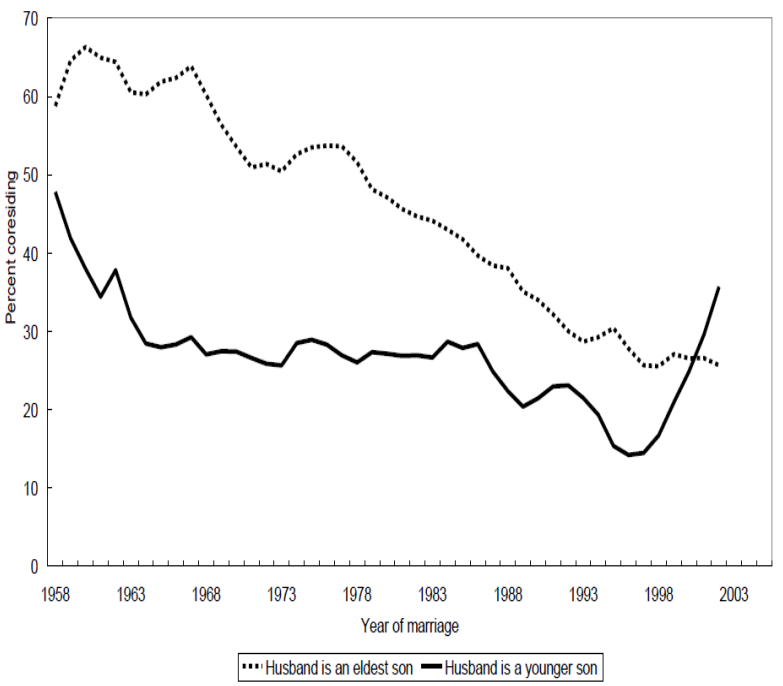
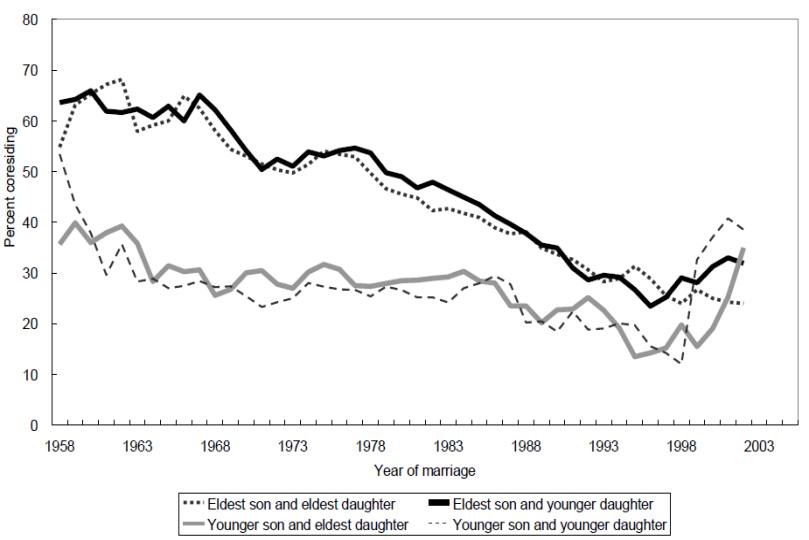


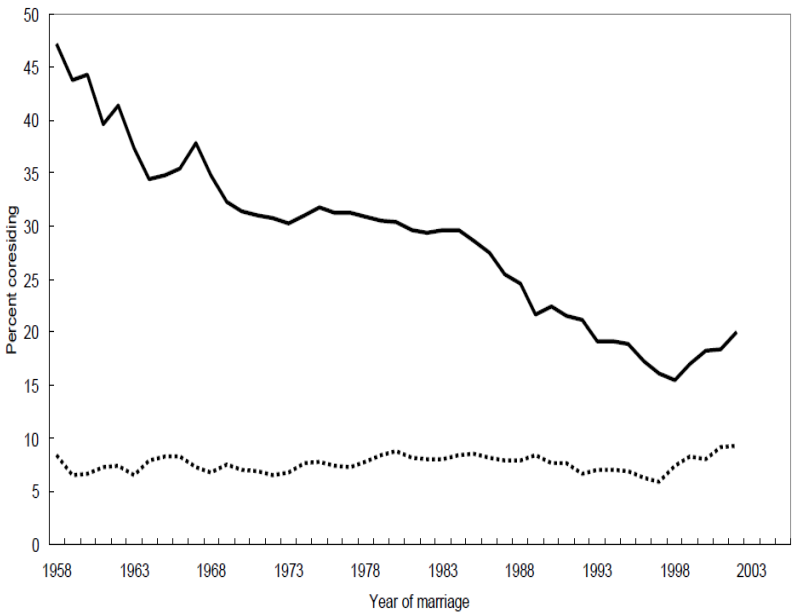
Figure 8 shows the trend in coresidence by couple type. The figure indicates that coresidence is determined mainly by whether the husband is an eldest son or a younger son, and not so much by whether the wife is an eldest daughter or a younger daughter. It also indicates that the effect of "eldest son" on coresidence has diminished over time, reflecting the weakening of the traditional norm of coresidence of eldest son with eldest son's parents. The trends after 1998 are especially interesting. Between 1998 and 2003, coresidence did not increase for eldestson-eldest-daughter but did increase moderately for eldest-son-younger-daughter, probably because some couples in which the husband was the eldest son could not move in with husband's parents (because of the presence of an unmarried younger son) but could fairly easily move in with wife's parents if the wife was a younger daughter. By contrast, coresidence increased dramatically for younger-son-eldest-daughter and even more so for younger-son-younger-daughter. The especially large increase in coresidence for younger-son-younger-daughter is expected, because these couples had greater opportunity for coresidence not only with husband's parents but also with wife's parents.

Figure 8. Trends in coresidence of newly married couples with parents by couple type



Numbers of cases are large enough that one can disaggregate coresidence with parents according to whether the coresidence is with husband's parents or wife's parents. Figure 9 shows that the downward trend in coresidence until 1998 is entirely due to decline in coresidence with husband's parents. Coresidence with wife's parents is much lower than coresidence with husband's parents, and the trend in coresidence with wife's parents is flat until 1998. After 1998, the trend is upward for both coresidence with husband's parents and coresidence with wife's parents.

Figure 9. Trends in coresidence of newly married couples with parents by whether the parents are husband's parents or wife's parents



A more nuanced picture emerges when one disaggregates Figure 9 further, according to whether the husband is an eldest son or a younger son. This is done in Figure 10, which shows the trend in coresidence with husband's parents and the trend in coresidence with wife's parents by whether the husband is an eldest son or a younger son. Given Japan's traditional pattern of coresidence of parents with the eldest son, one expects that, in

response to hard times after 1998, couples are more likely to move in with the husband's parents if the husband is an eldest son than if the husband is a younger son. One also expects that couples are more likely to move in with the wife's parents if the husband is a younger son than if he is an eldest son. Figure 10 confirms both of these expectations.

Figure 10. Trends in coresidence of newly married couples with parents, by whether the parents are husband's parents or wife's parents and whether the husband is an eldest son or a younger son

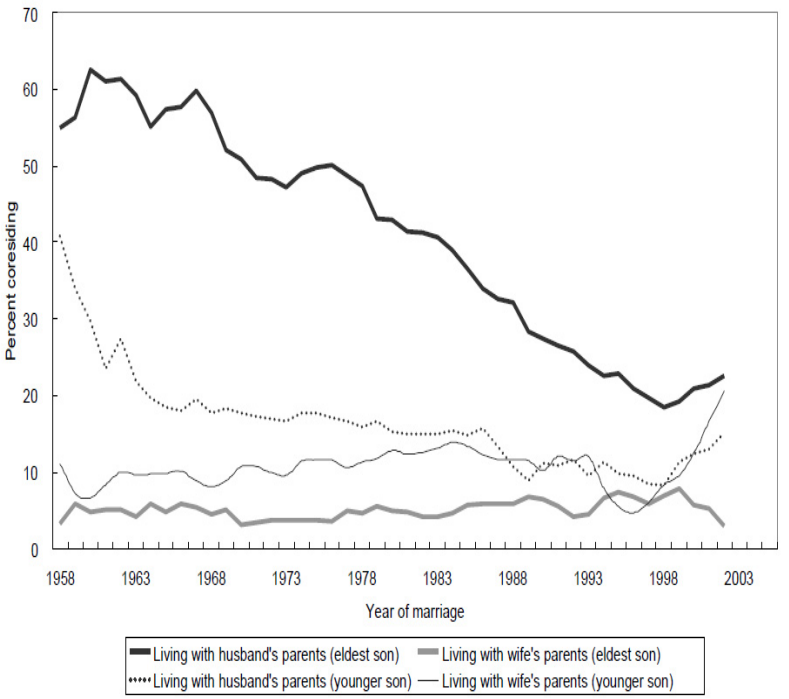


Figure 10 also shows that, prior to 1998 among couples in which the husband was an eldest son, coresidence with husband's parents was much more common than coresidence with wife's parents, although this difference declined considerably by 1998. The difference declined because coresidence with husband's parents greatly declined, while coresidence with wife's parents changed little. After 1998 among

these same couples in which the husband was an eldest son, coresidence with husband's parents rose and coresidence with wife's parents fell.

Among couples in which the husband was a younger son, the pattern before 1998 was somewhat similar to that among couples in which the husband was an eldest son, but at lower levels of coresidence and with the difference between the trend in coresidence with husband's parents and the trend in coresidence with wife's parents narrowing to the point of convergence by the late 1980s. After 1998 among these same couples in which the husband was a younger son, coresidence with husband's parents and coresidence with wife's parents both increased substantially, with the increase in coresidence with wife's parents being especially dramatic.

It appears from Figure 10 that, with increased demand for and perhaps also increased competition for coresidence as a consequence of the economic crisis of 1998, eldest sons were more likely than previously to assert their traditional right to coresidence with their own parents, with the result that, among couples in which the husband was an eldest son, coresidence with wife's parents became less likely and, among couples in which the husband was a younger son, coresidence with wife's parents became much more likely.

Figure 11 shows the trend in coresidence at time of marriage by wife's pregnancy status at time of marriage. Until 1984, the proportion coresiding at time of marriage was about the same for couples in which the wife was already pregnant and couples in which the wife was not already pregnant. After that the two trends diverged. Among couples in which the wife was already pregnant, coresidence changed little after 1984. By contrast, among couples where the wife was not already pregnant, coresidence fell substantially between 1984 and 1998 and then rose after 1998. The proportion coresiding among couples in which the wife was already pregnant also rose after 1998, but there are not enough cases in our data set to extend the trend for "pregnant at time of marriage" beyond 1999. The results in

Figure 11 suggest that a significant weakening of the norm of coresidence occurred after 1984, as the country entered the period of the bubble economy, but that the declining norm of coresidence translated into an actual decline of coresidence only if the wife was not pregnant at time of marriage.

Figure 11. Trends in coresidence of newly married couples with parents by wife's pregnancy status at time of marriage

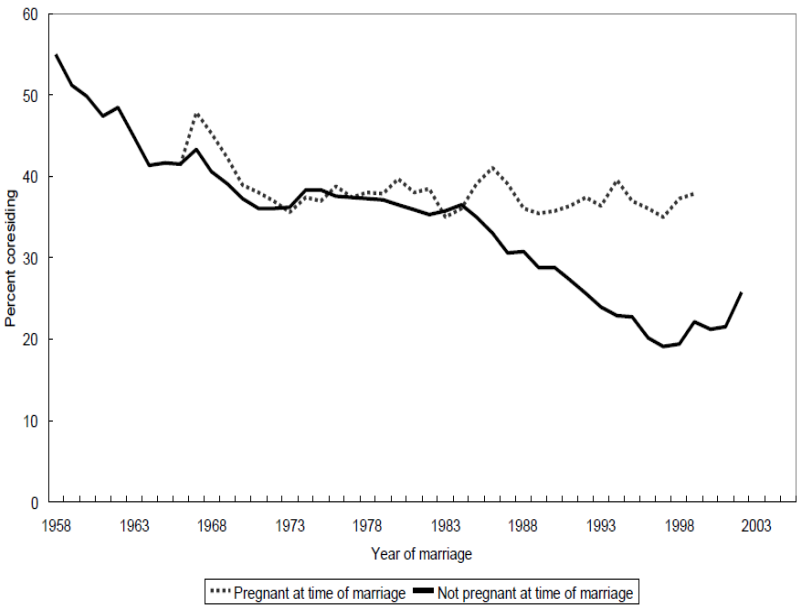


Figure 12 shows the trend in coresidence by wife's education, which is another variable in the "explains" group of predictor variables in the earlier multivariate analysis. Coresidence dropped much more dramatically among university-educated women than among women in other education groups during the period of very rapid economic growth between 1968 and 1973. It then rose more dramatically among university-educated women than among women in other education groups after the oil shock of 1973. The much larger shifts for university-educated women than for less-educated women likely occurred because university-educated women at that time were few in number and tended to come from wealthy families who could help a

young couple buy a home when times were good and who had homes that were big enough for coresidence with the young couple when times were bad. Coresidence rose at all levels of education around the time of the 1998 economic crisis.

Figure 12. Trends in coresidence of newly married couples with parents by wife's education

Figure 13 shows trends in coresidence for women at time of marriage for full-time paid workers and part-time paid workers (including fixed-term contract workers). Numbers of cases for part-time workers are fairly small, because most women who worked before marriage worked full-time, although the proportion working part-time rose considerably after 1998, as seen earlier in Table 1. The trend in coresidence for full-time workers is relatively smooth, because these workers have considerable job security and are therefore more insulated from the effects of economic shocks. This is not so for part-time workers, who have little job security and few benefits. As a consequence they tend as a group to experience a steep rise in coresidence after an economic shock. As shown in Figure 13,

part-time workers experienced steep increases in coresidence after the 1973 oil shock, the milder oil shock of the early 1980s, the bursting of the bubble economy in 1990, and the 1998 economic crisis; and they experienced steep falls in coresidence each time the economy recovered.

The underlying dynamics likely were that, following an economic shock, part-time workers without the option of coresidence were more likely to postpone marriage than part-time workers who did have this option. This kind of adverse selection into marriage would produce not only an increase in the proportion coresiding among those who did marry, but also a leveling off or decline in age at marriage, since coresidence tends to be associated with a younger age at marriage. Adverse selection may be part of the explanation of why age at marriage fell while coresidence rose after 1998 (Figure 1 and 4). On average over the entire estimation period, the proportion coresiding at time of marriage did not differ greatly between full-time workers and part-time workers.

Figure 13. Trends in coresidence of newly married couples with parents by wife's full-time and part-time paid work before marriage

Ⅵ. CONCLUSION

This paper begins to fill a gap in the coresidence literature by analyzing a rarely studied aspect of coresidence, namely the trend in coresidence of newly married couples with parents. The analysis has been possible because of a unique data set comprising a long series of national surveys undertaken by the Mainichi Newspapers of Japan that asked questions about not only year of marriage but also whether the newly married young couple coresided with parents, at least for a while. For purposes of analysis, the various surveys were pooled into a single data set. In the analysis, the time dimension of the trend in coresidence is defined as year of marriage, indicating marriage cohort. Thus the analysis is a cohort analysis, not a period analysis.

The multivariate part of the analysis suggests that the main causes of the long-term decline in coresidence at time of marriage are the declining percentage of marriages that are arranged, rising mean age at marriage for wives, rising levels of education among both husbands and wives, and the declining percentage of couples who grew up in rural areas. Collectively these causes account for almost two-thirds of the downward trend in coresidence between the 1960-64 marriage cohort and the 2000-04 marriage cohort. Partially offsetting causes that tend to increase coresidence are the rising percentage of marriages in which the husband is an eldest son and the rising percentage of marriages in which the wife was pregnant at time of marriage.

The multivariate analysis is complemented by a more fine-grained but simple graphical analysis (not multivariate) that suggests that the surprisingly large and sustained upturn in coresidence after 1998 is accounted for mainly by a build-up of latent demand for coresidence in the years following the collapse of the bubble economy in late 1989.

Our interpretation of the evidence, which is tentative because of the indirect nature of much of the evidence, is that this build-up of latent demand for coresidence was largely a

consequence of postponed marriages in the expectation that the good times would return soon. Mean age at marriage rose to very high levels during this period, while the proportion of newly married wives who worked full-time before marriage declined and the proportion who worked part-time or did not work before marriage increased. Among those who worked full-time, coresidence declined during the lead-up to 1998. Among those who worked part-time, coresidence sharply increased after the bubble burst until 1993 and then declined. It appears that, when the 1998 economic crisis tipped the stagnant economy back into recession, a great many couples finally concluded that the good times were not going to return anytime soon after all and decided to get married. In order to marry and start a family during hard times, many of these couples resorted to coresidence out of economic necessity. Suddenly there was a much higher demand for coresidence, which generated a complex pattern of sub-trends of coresidence, depending on whether the husband was an eldest son or a younger son, whether the wife was an eldest daughter or a younger daughter, whether the couple coresided with the husband's parents or the wife's parents, whether the wife was pregnant at time of marriage, whether the wife had higher education, and whether the wife worked full-time for pay or part-time for pay before marriage. These sub-trends shed considerable additional light on the dynamics of how, at the individual couple level, marriage and coresidence adjusted to the 1998 economic crisis.

A major limitation of the analysis is that most of the variables that predict whether a newly married couple coresides also affect whether single persons marry in the first place. The percentages coresiding in this paper are basically conditional probabilities of coresidence, where the condition is that marriage actually occurs.

A more adequate analysis would also take into account the effects of predictor variables on the percentage of single persons who marry. Another limitation is that, because of our desire to

include husband's characteristics, we restricted the analysis to first marriages that were still intact at time of survey. The difficulty posed by this restriction is that the likelihood that a first marriage will be excluded because of divorce or widowhood increases as the gap between time of first marriage and time of survey increases, potentially biasing not only the level of the estimates of percentage coresiding but also the trend in this percentage. The analysis also lacks some important predictor variables not available in our data, such as whether the respondent or her husband coresided with parents just before getting married. Kojima (1990) has shown that prenuptial coresidence of each pouse has a strong effect on coresidence immediately after marriage. Had it been possible to include a variable for prenuptial coresidence, the estimated effects of some of the predictor variables in our analysis might have been different. A final limitation concerns the rising level of non-response in successive surveys, and the very high rates of non-response in the most recent surveys. It is possible that non-response is selective on variables that affect coresidence, thereby introducing another source of bias. Because of these limitations, the conclusions reached in this paper must be viewed as tentative and in need of further research.

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Gender Inequality in Labor Market and Fertility

Jongseo Park[1)]

Ⅰ. INTRODUCTION

In general, there is a high birth rate in Scandinavian countries, while a comparatively low birth rate in Southern European countries. Since the Southern Europe such as Italy and Germany stress on the family-oriented tradition and policy, while Scandinavian countries such as Sweden tend to focus on the individualistic tradition and policy, these differences may cause demographic differences by the social status of women(Chesnais, 1996). There must be a different structure among the societies in which women can freely choose one between the childbirth and economic activity according to her desire and in which women should inevitably choose one of them. This study started from an assumption that the structural characteristics which differ with countries could affect women's behaviors related to their childbirths.

Previous studies related to the childbirth had conducted largely at the level of a individual agent. Microeconomic approaches to fertility behavior had tended to pay attention to the income effect on women's decision on her childbirth by regarding a woman's behavior related to her childbirth as a reasonable decision of a rational subject.

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However, opinions placed more emphasis on structural restrictions differently from previous mainstream studies had been suggested since the 2000s(van Peer 2002; d'Addio and d'Ercole 2005).

It is known that the childbirth as a revealed preference is performed within the social and institutional structure actually given to them, and thus behaviors of an individual would be restricted by the structure, even if an economic analysis at the individual level imparts a meaning into only a revealed preference. Women often mention the nature of social and institutional system in which they can consider their childbirths when they express their thoughts about their ideal preferences. They say that they might have more children if they are placed in the different institutional structure (McDonald, 2006). It means that the institutional structure can be more useful for a decision on the childbirth than a individual preference. If women have less children than their hope, we should suggests critically some doubts about the nature of social structure.

It is the most important to analyze the labor market in the institutional and structural approach to a change in the birth rate because of the importance of the labor market in the industrial society in relation to women. As explained earlier, the existing general explanations about the fertility decline had attributed its cause to a change in the individual family size preference or women's participation into economic activities. But some scholars insist that the current demographic change is ultimately related to the tension in the labor market beyond the simple individual preference when considered the childbirth and employment environment in the industrial society(Adsera, 2005).

The economic explanation about the childbirth would not have suggested any questions about the structural effect of the labor market. The labor market tends to be assumed to be fixed when calculating reasonably the opportunity cost and utility of children resulted from women's childbirth. It should also be considered that the system of the labor market could decide the employment rate and its diversity including wages even if it was true that the wage effect exerts an important influence on women's decisions about their childbirth experience.

This study focus on variables which reflect the structural context of the labor market by the regions and assume that the structural context of the local labor market is reflected in the local opportunity structure(Cotter, 2002; Hank, 2001). The major subject of this study is to investigate the relations between the local opportunity structure and women' fertility level.

Ⅱ. THEORETICAL BACKGROUND

Differential Fertility by Regions

There is a need of emphasizing the importance of the differential fertility by the region as a method of supplementing limitations on the individual approach. The differential fertility by the region is based on a local context approach over the individual level. Hank found the geographical type in a region with the low fertility in which the general trend of a decrease in the fertility had continued without changes in the late 1960s and early 1970s. He insisted that several factors such as the population density, family movement, and job structure had the close correlation with the total fertility rate in a region.

The modern industrialization and urbanization resulted from a social and economic development caused a change in the fertility based on a demographic transition theory at the level of the generality in Korea(Kim Han Gon, 1993). This implies that the background of a residential district could be the important determinant of the differential fertility. The fertility behavior could greatly be changed according to what kinds of industries a community gained its subsistence centered on from the anthropological perspective. It could be considered how the values of children are changed and life environment make the realization of a large family difficult in a urban society compared with a farming area. The discussion about how the new social and economic structure prompted the small-family

oriented values is also subject to the assumption that the fertility behavior is primarily decided by the ecological environment and lifestyle(Kim Doo-Sub, 2007).

Hank analyzed the German panel data from 1984 to 1995 by dividing the German area into 75 areas(Raumordnungsregionen)(Hank, 2001). As a result, there was no evidence that the difference in the fertility observed at the regional level resulted from contextual effects. It was just concluded that most of regional changes was caused by the difference in the spacial distribution of individual characteristics. Variables at the regional level considered at this time were the degree of the urbanization, child-care facilities, and structure of the labor market. The structure of the labor market was measured by three variables such as the number of the employment, unemployment rate, and women's labor force participation rate. Variables at the individual level were the age at the delivery of the first child, education level, marital status, and the status of foreigner.

The Local Opportunity Structure and Fertility

The structural context which influenced the fertility level is expressed as the opportunity structure(Tomaskovic, 1987; Hank, 2001; Cotter, 2002). Individuals behavior according to their own characteristics and also according to restrictions on the special life environment within a region in which they live(Courgeau and Baccaini, 1998). The typical factor of life conditions could be expressed as local opportunity structures.

The concept of the opportunity structure has been mostly used in studies related the poverty. The human capital theory connect the wage to the productivity of hired workers in studies related the poverty, but the opportunity structure theory link the wage to the 'position'. People who enter the labor market are arranged by a matrix, most of the people who is evaluated as desirable workers tend to be placed on the high-wage position in front of the matrix(Tomaskovic, 1987).

The opportunity structures in regard to the fertility behavior are chiefly said as an economic opportunities and restrictions related to the pregnancy or practical factors related to the pregnancy, and regional population(Billy and Moore, 1992). Huinink and Wagner divided many opportunity structures which influenced characteristics of individuals in regard to the socialization of children and family formation (Huinink and Wagner, 1989: Hank, 2001)

On the other hand, the availability of the child-care facilities also accounted for a major part of local opportunity structures(Kravdal, 1996; Kreyenfeld and Hank, 2000). Public child-care facilities provide working mothers with an important means that they could continue their child-caring. According to Stolzenberg and Waite, the more available the child-care facilities are, the smaller the tension of working women to their children become(Stolzenberg and Waite,1984). The labor market could be influenced by women and adjusted in accordance with women when women participated in the local labor market actively. On the contrary, this worked out the effect of increasing job opportunities for women after their childbirth(Kravdal, 1996).

Meanwhile, the local occupational structure decides the possibility of entering good jobs. The opportunity cost of the childbirth would be increased in an area with lots of clerical works, especially insufficient child-care facilities because the employment within a region provides women with careers(Blossfeld, 1987).

The effect of the local unemployment rate is not obvious like that(De Cooman et al, 1987). The opportunity cost caused by the waiver of the labor market due to the childbirth would go up when the unemployment rate is low if the unemployment rate could be an index of the job number available. Thus, women's activities in the labor market would be increased and fertility could be lower. The low unemployment rate could increase the tendency of women's fertility(Hoem, 2000). The situation of the local labor market could easily be identified by indexes of the local social and economic situation, and general economic situations. Women would form a judgment that they could have children if this was recognized as a good condition (Hank, 2001).

Women's Labor Force Participation and Fertility

The opinion that women exchange it with childbirth because they are short of time as women's labor force participation rate is increased is a general explanation(Butz and Ward, 1979), since a microscopic analysis on the fertility decision had been developed in the 1960s(Becker, 1960; Mincer, 1963; Willis, 1973). By the way, a cross-sectional correlation coefficient between the total fertility rate and women's labor force participation rate the OECD countries had been changed from the negative to positive relation based on the mid-1980s(Ahn and Mira, 2002; Sleebos, 2003; Adsera, 2005). In other words, the negative relation between the total fertility rate and women's labor force participation rate in 23 OECD countries based on 1975 had been changed into the positive relation after the late 1980s(Adsera, 2005). It is interpreted to surpass the existing negative effect as the income effect on the fertility rate of women wage become bigger than the substitution effect. The condition that women could be free from the existing binary choice between the work and child-caring formed as the child-caring service available in the market become expanded. This change is identified as a factor which led to the correlation between the labor force participation rate and quantity of the fertility rate(Ahn and Mira, 2002).

The issue is that it is difficult to explain the reversal in the traditional negative relation between the fertility rate and the participation rate even if the micro-economic model could explain a general reduction in the fertility rate according to an increase in women's labor force participation rate. The early micro-economic model focus on the effect of women's wages on the childbirth, but overlook the point that the wage and employment level could be decided by the structural context of the labor market (Adsera, 2004, 2005).

Recent studies criticize the income effect model and suggest an alternative explanation by paying attention to the reversal in the correlation between the two variables. For example, the gender gap between the short-term and long-term unemployment show highly in young and married women, especially married women with young children in the country with the high women's unemployment rate(Ghazala Azmat et al., 2004). This indicates that the gender gap in the labor market could influence the childbirth.

It is proved that the present demographic change is ultimately related to the tension of the labor market in which the fertility decision is occurred, when considering the differences between industrial countries between the fertility rate and employment environment(Adsera, 2005). The rapid feminization in the labor force come into conflict with the system of the solid labor market which become adapted to fit for male workers of a main age group in the countries in which women's labor force participation rate is traditionally low, and this is eventually concluded to the comparatively higher women's unemployment rate and low fertility rate. The lower the total fertility rate is, the higher the difference between male and female unemployment become when viewing based on 1996. After all, the positive relation between the fertility rate and women's labor force participation is formed when the system of the labor market is positive toward the childbirth and decision on the labor force participation at the same time(Adsera, 2004).

The relation between women's labor force participation and childbirth does not come out into the open clearly in Korea. Results of many studies had showed this confusion. It was showed that the employed had the lower fertility level than the unemployed on an individual level analysis. The paid worker showed the lower fertility level than the unemployed in the light of women's employment position on an individual level analysis(Lee Sam-Sik et al, 2005). Meanwhile, the difficulty of the prediction was identified as the two conflicting possibilities was left open on an macro-analysis (Kim Tae-Hun, Lee Sam-Sik, Kim Dong-Hoe, 2005).

Gender Segregation in the Labor Market and Fertility

According to the theory of labor market segmentation, the labor market could be segmented into the first labor market with the high wage and stable employment and the second with the low wage and unstable employment because of factors such as the system or gender discrimination. Therefore, the theory of the labor market segmentation enable women's gender discrimination problem easily change(Keum Jae Ho, 2004). Generally, women's positions in the labor market tend to be influenced by the gender-related segmented structure.

The important characteristic in women's occupations is that those occupations are gender-stereotyped from the viewpoint of feminism. The occupation had been segmented by the gender from the pre-industrial society up to the present and women's labor had continuously been connected to the low-skill and low-wage(Tilly & Scott, 1987). The phenomenon of the low fertility rate mean not just a change in the external structure of population, but a change in the gender relation connect to the fertility rate when viewing in view of the correlation between the gender segmentation in the labor market and low fertility rate. An analysis of the gender relation is required on an analysis on the fertility phenomenon because the phenomenon of the low fertility rate has historically been related to the partnership between adult men and women and also is a result shown when the gender relation and social system such as the family structure surrounding the partnership and labor market are manifoldly connected(Lee Jae Kyung et al, 2005).

The phenomenon of the occupational segregation by the gender and age exerts not only an negative effect on women's wages and working conditions but also is identified as a main cause which created the vulnerability of the women labor market due to the very serious degree of employment instability(Kwon Hea Ja, 2007; Eun Soo Mi, 2007).

In practice, It had already been verified that the relation between the existence of the crowding hypothesis and wage gap, which showed the job segregation in the Korean labor market. The occupational segregation by the gender has still been persisted or strengthened in spite of an increase in women's labor force participation, and it is difficult to view that these changes have been visible in the whole labor market even if entry barriers into the male-dominated occupations have been eased off (Keum Jae Ho, 2002).

The gender inequality and wage gap in the labor market like this could work as factors of declining the fertility level and hindering women's labor force participation. The inequality in the labor market function as an important mechanism which make women delay their childbirth even if there is a difference in the degree of inequality according to the fields such as highly educated professional and managerial women, production, sales, service, and simple labor. There is a tendency of delaying the childbirth in a case of the professional and managerial women until they reach stable positions(Jang Jee Hyun, 2005).

The gender inequality not only in the labor market but also at the general level could be connected to the low fertility phenomenon. The values about traditional gender roles such as the marriage, childbirth, and child-care have considerably been changed as women's education opportunities have expanded and social participation has also increased. The level of the equality of the sexes in the public area such s law and system begin to show the gap between the level of the equalities of the sexed in the private area of the daily life such as traditional gender roles as it has been improved. The bigger difference between the equality for both sexes from the formal and institutional, and practical level there is in a society, the clearer the tendency of a low fertility appear(McDonald, 2000).

Ⅲ. METHOD

Data and Variables

The proper analysis approach that considered the individual and local level at the same time was the multi-level analysis method when effects of structural characteristics of the local labor market focused in this study on the fertility decision of a individual were analyzed. In this study, the level 1 and 2 were respectively set up as an individual and region(the local government).

Individual level variables, which could be included in an analysis was composed centered on individual level variables identified through previous studies. These variables were mother's age, mother's age at her first marriage, mother's education, economic activity, types of housing ownership, types of house, and number of rooms in a house.

The region level variable could be largely divided into the region background and labor market-related variable group. The former included rate of married couples, sex ratio at birth, ratio of children participating in the child care program, and tax burden per capita, while the latter contained the female employment rate, rate of paid female workers among female employment, wage differences between male and female, and occupational segregation index.

The Duncan's index generally is employed as the occupational segregation index. The occupational segregation index has the value between 0 and 1. Occupations between men and women are in an unseparated state at all if the occupational segregation index is 0, while occupations between men and women are in a completely separated state if the occupational segregation index is 1.

All the data should basically be one which the statistical value could be calculated by the region for an multi-level analysis attempted in this study. Some of individual and labor market related variables were utilized from the data of 2005 Population and Household Census Data(2% sample) with unique identifiers

by 234 administrative districts. A dependent variable such as the total number of children ever born and individual level independent variables such as mother's age and education, economic activity, age at the first marriage, and housing-related variable were used from the Population and Household Census Data.

Variables showing structural characteristics of the labor market should be secured as the data which could be calculated by 234 administrative districts. The data of <the Occupational Employment Statistics: OES> conducted by Korean Employment Information Source which contained items related to the labor market in abundance and an approach by 234 districts was used for this study. For labor market variables, all the items available from the Population and Household Census Data were first used and wage variables were calculated by 234 districts from the 2005 OES data.

Variables needed to control regional characteristics in addition to the labor market were included. The rate of married couples among fertile women by the region to reflect the basic structure of population and marital status was covered. The data related to the rate of children participating in child-care programs and tax share per capita were collected as associate variables within a region with an relation with fertility behaviors from Statistical Year Book published by 16 cities and provinces.

Research Methods

This study used an multi-level analysis. An multi-level analysis was used when the data had an hierarchical structure or multi units(levels) of an analysis were considered. Especially, multi-level models in sociology were usefully used when the individual level result was explained in terms of the social context. It could be said that these models were the best suitable analysis methods that the individual and local level could be considered at the same time when effects of structural characteristics of the local labor market focused in this study on the fertility decision of the individual were analyzed.

Ⅳ. RESULTS

Description of the Samples

The average number of children ever born among fertile women from the 2005 Population and Household Census Data analyzed in this study was 1.76 people(standard deviation 0.82) and sample included in an analysis was 157, 042 people. There was 1.64 in Seoul, the smallest on a national scale. As the average number of children ever born among fertile women was 1.70 in Gyeonggi, 1.72 in Incheon, 1.72 people in Busan, these three regions showed lower rates than other regions. The following is the results of ANOVA or T-test on total number of children ever born by the individual independent variables.

Basic characteristics of regional background variables of level 2 were presented as follows. Regional background variables of level 2 included variables such as the rate of married couples, sex ratio at birth, tax burden per capita, and rate of children participating in child-care programs among fertile women. These variables carried a meaning of the control variable to identify the true effect of the labor market variable by the region. The basic population structure and marital status were considered in variables of the rate of married couples. The rate of married couples among fertile women was included in an analysis model as the variable which could consider the size of fertile women by the region and marriage rate at the same time in terms of the population structure

Table 1. Comparison Mean of Total Number of Children ever Born

		Mean	Std. Dev.	N	F / t	P
Age group of mother	20~29	0.88	0.80	15,795	13948.32	0.000
	30~39	1.72	0.77	66,795		
	40~49	1.99	0.74	74,472		
Age group of mother at first marriage	20~29	1.81	0.80	145,234	3492.57	0.000
	30~39	1.18	0.87	11,314		
	40~49	0.83	1.00	479		
Educational attainment of mother	Middle & under	2.07	0.89	25,239	3962.98	0.000
	Height school	1.81	0.77	80,066		
	College & over	1.54	0.82	51,757		
Economic Activity	Employed	1.77	0.86	70,945	20.16	0.000
	Not employ	1.76	0.79	86,099		
Types of housing ownership	Owned	1.87	0.78	98,121	2412.70	0.000
	Tenement	1.55	0.84	31,994		
	Monthly rent	1.62	0.88	26,947		
Types of house	Detached Dwelling	1.83	0.92	51,980	146.43	0.000
	Apartment	1.74	0.76	83,970		
	Row House	1.72	0.81	17,734		
	House with commercial building	1.73	0.90	3,378		
Number of rooms	1	1.26	0.98	6,870	2210.52	0.000
	2	1.61	0.86	48,017		
	3	1.84	0.77	87,972		
	4 & over	2.02	0.77	14,203		

Table 2. Descriptive Sample Statistics of Regional Basic Variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Married couples rate	234	61.54	7.14	40.34	76.10
Sex ratio at birth	234	108.06	9.20	77.46	152.33
Childcare participation rate	234	49.22	13.83	12.00	107.65
Tax burden per capita (KRW)	234	650,949	667,491	229,190	8,042,010

The number of level 2 groups was 234 regions in this analysis and the observation value shown in the table below was 234. The regional average of the rate of married couples over 234 regions was 61.5%. The lowest and highest region showed 40.30% and 76.10% respectively. The overall average of sex ratio at berth was 108.06. The average rate of children participating in child-care programs over 234 regions was 49.2%. The lowest and highest region showed 12.0% and 107.65% respectively.

Table 3. Top Five and Low Five of Mean Values by Regional Basic Variables

(Unit: %, KRW)

	Region	Married couples rate	Region	Sex ratio at birth	Region	Childcare participation rate	Region	Tax burden per capita
Low five	Gwangju Donggu	40.3	Pyeongchang-gun	127.4	Ulleunggun	12.0	Goheunggun	229,190
	Daegu Junggu	44.2	Boeungun	134.3	Gunposi	23.2	Sinangun	246,567
	Busan Junggu	44.8	Ulleunggun	146.2	Osansi	25.7	Sunchang-gun	246,972
	Gangnamgu	45.5	Seongjugun	151.5	Tongyeong-si	26.5	Jindogun	247,158
	Daegu namgu	45.5	Goryeonggun	152.3	Gurisi	27.4	Jangheung-gun	247,612
Top five	Ulsanbukgu	74.3	Jeongseon-gun	86.6	Namhaegun	82.3	Seochogu	2,038,055
	Wandogun	74.9	Imsilgun	86.8	Uiryeonggun	89.4	Jongnogu	2,592,523
	Yanggugun	74.9	Cheongyang-gun	88.4	Gangjingun	89.5	Gangnamgu	2,684,790
	Hwacheon-gun	75.7	Muangun	88.8	Muangun	94.0	Seouljunggu	5,504,703
	Ongjingun	76.1	Gokseonggun	92.1	Gangseogu	107.6	Gwacheonsi	8,042,010

The focus of an analysis in this study was the structural characteristic of the labor market. The structural characteristic was largely measured as four variables. The following table shows the basic statistics of the labor market variable. The lowest and highest region displayed respectively 32% and 71%, and the gap was over two times as the overall average of women employment rate in 234 regions based on 2005 was 48%. The overall average of the rate of female paid workers among female employment over 234 regions was 61%. The lowest and highest region showed 13% and 86% respectively. The overall average of the wage gap between men and women over 231 regions was 58%. This meant that the average wage of women was 58% of men. There was the three time-difference between them as the lowest and highest region presented 31% and 98%.

Table 4. Descriptive Sample Statistics of Regional Labor Market Variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Female employment rate	234	0.48	0.09	0.32	0.71
Rate of female paid workers	234	0.61	0.19	0.13	0.86
Gender pay gap	231	58.56	11.15	31.59	98.80
Occupational segregation index	234	0.29	0.08	0.06	0.59

If values of labor market-related variables were arranged by the 234 regions, its distribution could be identified. Values shown in the low 5 and top 5 regions were suggested in the following table. Women's employment rate was formed in the low regions at the 30% and top regions at the 70%. It was assumed that workers in agriculture, forestry, and fishery were included when seeing that the top regions that women workers belonged were mainly the gun areas of a region. There was a very big difference in the rate of paid workers among women employment between the low and top regions.

The low and top areas were respectively distributed at the 10% and 80%. It was noticeable that all the top areas were distributed in Seoul, and especially adjacent to Yeongdeungpo and Guro-gu in south of the Han River. It could be understood that a large of paid women workers lived comparatively in these areas. Women's wage rates to men's wage were diffused in a range between 30% and 90%, and occupational segregation index covered a scope between 0.1 and 0.6.

Table 5. Top Five and Low Five of Mean Values by Regional Labor Market Variables

(Unit: %)

	Region	A	Region	B	Region	C	Region	D
Low five	Yuseonggu	0.3	Sinangun	0.1	Jgangeunggun	31.6	Wandogun	0.1
	Ulsandonggu	0.3	Jindogun	0.2	Hamyanggun	33.8	Seochogu	0.1
	Ulsanbukgu	0.3	Yeongyanggun	0.2	Hadonggun	34.5	Seouljunggu	0.1
	Yeosusi	0.4	Jangsugun	0.2	Gyeryongsi	34.9	Buangun	0.1
	Gyeryongsi	0.4	Jinangun	0.2	Geumsangun	35.7	Sunchang-gun	0.1
Top five	Gunwigun	0.7	Gurogu	0.8	Cheongsong-gun	85.8	Gapyeonggun	0.5
	Goesangun	0.7	Dongjakgu	0.8	Jeungpyeong-gun	86.4	Gwangyang-si	0.5
	Hapcheongun	0.7	Yeongdeungpo-gu	0.9	Incheondong-gu	89.2	Ulsandonggu	0.5
	Uiseonggun	0.7	Gwanakgu	0.9	Busanjunggu	89.9	Geojesi	0.5
	Sunchanggun	0.7	Geumcheongu	0.9	Boryeongsi	98.8	Ulleunggun	0.6

note: A-Female employment rate, B-Rate of female paid workers, C-Gender pay gap, D-Occupational segregation index.

Unconditional Model

The start of an analysis in the multi-level analysis could be regarded as the unconditional model. The samples of level 1 included in the basic model was 157, 044 people. The least and most case included in a group was 32 and 3,778 people as the number of groups was 234.

On average, 671.1 people belonged to a group. The rho value representing the intraclass correlation was 0.05, which means that the variance of intra-group explain about 5% of the whole variance with respect to the total number of children ever born. This shows that the unconditional model has statistical significance because the value is in the confidence interval even if the degree of explanation is small.

Table 6. Variance-components Model Results of Total Number of Children Ever Born

	Coef.	Std. Err.	z	*p*>z	95% Conf.	Interval
intercept	1.864261	.0128478	145.10	0.000	1.83908	1.889443
/sigma_u	0.1901839	0.0095436			0.1723691	0.2098398
/sigma_e	0.8129445	0.0014517			0.8101043	0.8157948
rho	0.0518901	0.0049413			0.0429012	0.062315

Economic Activity and Fertility

Women's labor force participation rate is treated as an important factor in a change in the fertility rate. Especially, the labor force participation rate, a macro-index in regard to the labor market provided many implications in explaining a change in the fertility. Lots of international and domestic studies had mentioned the correlation between the fertility and women's labor force participation rate all the while.

Women's labor force participation rate in Korea had gradually been increased and recently kept the 50% level. It seems that the rate had decreased at 2%p compared with the ten years between 1995 and 2005, a period of this study. Men's labor force participation rate had been decreased for the last ten years, while women's labor force participation rate tended to be increased, but showed no big change for the recent several years.

Women's labor force participation rate by the age in Korea presents the M typed curve showing a tendency to exit from the labor market at marriage, pregnancy, and before and after childbirth. Many problems such as the stop of the economic activity due to the childbirth and cut-off of a career were pointed out in connection with this.

This study analyzed the relation between female employment and fertility by the three models. <Model 1> analyzed the relation between female employment rate and the total number of children ever born, <Model 2> the relation between the rate of paid women workers and the total number of children ever born, and <Model 3> the relation between the two variables and the total number of children ever born when the two variables were included at the same time.

As the analysis result, women's employment rate by the region showed the positive relation with the total number of children ever born in <Model 1> and this result was statistically significant(p<0.001). It is interpreted that the fertility level of women who live in a region with high female employment rate is comparatively higher than other regions. <Model 2> shows the relation between the rate of paid women workers and the total number of children ever born. The rate of paid women workers showed the negative relation with the total number of children ever born, and this result was statistically significant(p<0.001). It is disclosed that the fertility level of women who live in a region with the high rate of paid women workers is comparatively lower than other regions.

This result is the same with the previous micro level analysis and also with a tendency in the European countries before the mid-1980s(Lee et al, 2005; Ahn and Mira, 2002; Sleebos, 2003; Adsera, 2005). However, this result is conflicting with an analysis result of <Model 1>. The explanation of <Model 1> was that a region with the high rate of female employment rate showed the high fertility level, while the result of <Model 2> was that a region with the high rate of paid women workers had the low fertility level. It was interpreted that the employment itself exerted a positive effect on the childbirth, but a reverse effect on the childbirth of paid workers when reviewing based on the whole employment. Especially, it could be regarded that the structural problems of the labor market with respect to paid workers give rise to a negative effect on the childbirth.

<Model 3> is a model which the two variables are included. Female employment rate do not show the statistical significance in <Model 3>, whereas its result match up with one of <Model 2> as the rate of paid women workers display the statistically significant and negative relation. It seems that the importance of paid women workers variable between the two variables need to be emphasized as the statistical significance of women's employment rate variable disappear

Table 7. Multi Level Estimates of the Effects of Female Economic Activity on Total number of Children Ever Born

		Model 1		Model 2		Model 3	
		Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
Intercept		-0.430***	0.122	0.530***	0.141	0.533**	0.185
Mother's age		0.056***	0.001	0.056***	0.001	0.056***	0.001
Age at first marriage		-0.065***	0.001	-0.065***	0.001	-0.065***	0.001
Edu. (College)	Middle & under	-0.033**	0.012	-0.032**	0.012	-0.032**	0.012
	Height school	0.103***	0.008	0.104***	0.008	0.104***	0.008
Housing ownership (Owned)	Tenement	-0.059***	0.009	-0.058***	0.009	-0.058***	0.009
	Monthly rent	-0.030**	0.010	-0.029**	0.010	-0.029**	0.010
House types (Detached dwelling)	Apartment	-0.034***	0.008	-0.032***	0.008	-0.032***	0.008
	Row house	-0.036**	0.011	-0.033**	0.011	-0.033**	0.011
	etc.	-0.124***	0.027	-0.125***	0.027	-0.125***	0.027
Number of rooms		0.172***	0.005	0.171***	0.005	0.171***	0.005
Married couples rate		0.008***	0.001	0.004***	0.001	0.004***	0.001
Sex ratio at birth		0.002	0.001	0.001	0.001	0.001	0.001
Childcare participation rate		0.005***	0.001	0.003***	0.001	0.003***	0.001
Tax burden per capita (KRW)		0.000***	0.000	0.000***	0.000	0.000**	0.000
Female employment rate		0.574***	0.106			-0.004	0.129
Rate of female paid workers				-0.519***	0.060	-0.521***	0.078
Random-effects Parameters		Estimate	Std. Err.	Estimate	Std. Err.	Estimate	Std. Err.
level 2 variance		0.005*	0.001	0.003*	0.001	0.003*	0.001
level 1 variance		0.470*	0.003	0.470*	0.003	0.470*	0.003

Wage Gap, Occupational Segregation and Fertility

This study analyzed how the gender segmentation variables such as the occupational segregation index and gender pay gap in the labor market have the effects on fertility level. There had nearly been no change in the wage gap between men and women in Korea since the 1990s. There was a little difference by the education, but no big difference in the wage rate between men and women even if the education level of women had been heightened and labor force participation rate had also been increased. Women's wage was about 60.6% of men's in 1990 and gradually increased up to the 68.8% level when men's wage was regarded as 100. However, It was difficult to regard this increase as a big increase compared with the elapsed time.

The occupational segregation index has the range from 0 to 1. If the index is 0, it means that the structure of the labor market do not segregate between men and women by occupations at all. If the index is 1, its structure is fully separated in occupations by the gender. The meaning that occupations are strictly separated by the gender is that women tend to be in different jobs or occupations to those of men and within a particular occupation tend to hold the lower status and lower rewarded positions. So, women workers are heavily concentrated in relatively few occupations, frequently those with a large demand for part-time workers. In general, this tendency could be much more strongly developed if the occupational segregation was overlapped with the gender discrimination. The deprivation and exclusion of opportunities like this could discourage the hope for the future and negatively influence the childbirth.

The study composed and analyzed the total 4 models by considering the correlation between the wage gap and occupational segregation index in this chapter. <Model 1> is a model that a variable of gender pay gap is added to a model including the individual level and regional background variable. <Model 2> is a model including only the occupational

segregation index, <Model 3> is a model including gender pay gap, occupational segregation index, and the interaction between the two variables, and <Model 4> is a model including the rate of female paid workers, gender pay gap, occupational segregation index, and interaction between the two variables at the same time.

According to an analysis result, women's wage rate did not show any statistic significance in <Model 1>, and also the occupational segregation index did not show any statistic significance in <Model 2>. It was hard to see that each variable affected the total number of children ever born by the regions. But the two variables showed to be statistically significant with the negative relation with the total number of children ever born when the interaction was controlled in <Model 3>.

The occupational segregation index was statistically significant with the negative relation with the total number of children ever born. At last, the interaction between women's wage rate and occupational segregation index was the same even when the rate of paid women workers by the region was controlled in <Model 4>. The effect of women's wage rate was comparatively poor(coefficient 0.005) and one of the occupational segregation index(coefficient 0.939) had largely in this model.

Table 8. Multi Level Estimates of the Effects of Gender Pay Gap and Occupational Segregation Index on Total number of Children Ever Born

		Model 1		Model 2		Model 3		Model 4	
		Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
Intercept		-0.162	0.134	-0.250*	0.121	0.156	0.203	0.880***	0.199
Mother's age		0.056***	0.001	0.056***	0.001	0.056***	0.001	0.056***	0.001
Age at first marriage		-0.065***	0.001	-0.065***	0.001	-0.065***	0.001	-0.065***	0.001
Edu. (College)	Middle & under	-0.032**	0.012	-0.031**	0.012	-0.032**	0.012	-0.033**	0.012
	Height school	0.103***	0.008	0.103***	0.008	0.103***	0.008	0.104***	0.008
Housing ownership (Owned)	Tenement	-0.061***	0.009	-0.061***	0.009	-0.061***	0.009	-0.058***	0.009
	Monthly rent	-0.033**	0.010	-0.032**	0.010	-0.033**	0.010	-0.029**	0.010
House type (Detached dwelling)	Apartment	-0.040***	0.008	-0.040***	0.008	-0.040***	0.008	-0.033***	0.008
	Row house	-0.037**	0.011	-0.037**	0.011	-0.038**	0.011	-0.033**	0.011
	etc.	-0.127***	0.027	-0.124***	0.027	-0.127***	0.027	-0.128***	0.027
Number of rooms		0.171***	0.005	0.171***	0.005	0.171***	0.005	0.171***	0.005
Married couples rate		0.009***	0.001	0.010***	0.001	0.010***	0.001	0.004***	0.001
Sex ratio at birth		0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Childcare participation rate		0.006***	0.001	0.006***	0.001	0.006***	0.001	0.003***	0.001
Tax burden per capita (KRW)		0.000***	0.000	0.000***	0.000	0.000***	0.000	0.000**	0.000
Rate of female paid workers								-.522***	0.060
Gender pay gap(A)		-0.001	0.001			-0.006*	0.003	-0.005*	0.002
Occupational segregation index(B)				-0.036	0.099	-1.097*	0.511	-0.939*	0.449
Interaction(A×B)						0.018*	0.009	0.017*	0.008
Random-effects Parameters		Estimate	Std. Err.	Estimate	Std. Err.	Estimate	Std. Err.	Estimate	Std. Err.
level 2 variance		0.005*	0.001	0.005*	0.001	0.005*	0.001	0.003*	0.001
level 1 variance		0.469*	0.003	0.470*	0.003	0.469*	0.003	0.469*	0.003

* $p<0.05$; ** $p<0.01$; *** $p<0.001$

Ⅴ. DISCUSSION AND CONCLUSION

This study attempted to indicate the limitations of an approach at the individual level regarding the relation between women's childbirth and the labor market, and suggest the necessity of supplementing the relation between the two variables with a structural approach over the individual level. The micro-economic analysis which focuses on an individual approach tends to fix the effect of the labor market on women's decision on their childbirth without raising a question about the labor market itself. However, the current demographic change is ultimately related to the tension in the labor market(Adsera, 2005). It should not be overlooked that the wage or employment conditions can be decided by the system of the labor market. The analysis on women's decision on their childbirth should naturally reflect not only the individual level but also institutional and structural effects of the labor market if these contexts were considered.

This study suggested the relation between structural characteristics of the local labor market and childbirth level as a major subject of the study. In theory, the study noticed the relation that structural characteristics of the labor market by the region exerted influence on the number of children. The local opportunity structure is related to economic opportunities and restrictions in regions(Tomaskovic, 1987; Billy and Moore, 1992; Hank, 2001; Cotter, 2002). This study included effects of the local background such as the rate of married couples, sex ratio at birth, rate of children in the child care program, and tax burden per capita in the analysis model by assuming that the opportunity structure reflected every characteristics of the local area. Also, the female employment rate, rate of paid female worker, gender pay gap, and occupational segregation index were set up by the region as variables which measured the structural context of the labor market corresponding to the analysis focus of this study.

The theoretical issue related to the level of women's participation in the economic activities in the structural context of the labor market is what kinds of relations(positive or negative relation) the level of women's participation in the economic activities and the level of fertility had. As a result of an analysis, there was a positive relation between the female employment rate and fertility. It was difficult to interpret that the system of Korean local labor market exerted an positive effect on the childbirth from the gender perspective in view of this result because the gender gap in the labor market was not small enough to explain the relation between women's economic activities and the number of childbirth in Korea(Keum Jae Ho, 2002). It is worth of notice that the result conflicting with the positive relation mentioned earlier was found in the analysis model which included the variable of the rate of female paid workers, another variable which presented the degree of women's economic activity. There was the negative relation between the rate of female paid workers and fertility level. Especially, the statistical significance of the female employment rate variable disappeared, but only the rate of paid female workers showed the negative relation in a model which included the two variables of the female employment rate and rate of paid female workers at the same time. It could be seen that there is the characteristic difference between a group of the whole female workers and a group of paid workers among female workers. It was interpreted that there is the heterogeneous structure in regard to the childbirth among any groups of worker in the Korean labor market, and also paid-workers have experienced comparatively many difficulties with respect to childbirth as compared with other groups. This implied that the variable of paid female workers was more important than the variable of the female employment rate.

From the point of view of gender issues, the result of an analysis that there was the negative relation between the rate of paid female workers by the region and the level of birth could be explained in connection with the institutions of work and life balance.

In general, paid female workers are not fully guaranteed to balance a career and family in the system of the Korean labor market, and so fertility level of paid female workers is very low(Kim Hye Won et al, 2007; Chang Hye Kyung et al, 2007). The legal maternity leaves and childcare leave system available during the pregnancy and childbirth, and infant nursing period have a very low utilization at the actual workplace. The utilization of the parental leave system is very limited to major companies or specially designated industries, while it goes down in the small and medium business, companies which hired lots of irregular female workers, service, and agencies. The system of the labor market like this lowered the level of fertility among paid female workers.

The second focus on the analysis of this study was the relation between the gender inequality index and fertility level. The wage difference and occupational segregation by the gender in the Korean labor market have been empirically analyzed(Keum Jae Ho, 2002; Euh Soo Bong, 1991; You Kyung Joon, 2001; Hwang Soo Kyung, 2001). Especially, the current job family system was implicit in the possibility that the gender discrimination became permanent as it was targeted mainly at women as objects of separate job family system in most industries(Lee Joo He, 2007).

There is a high possibility that women's decisions on their childbirth could be fallen under the negative influence if the level of tension by the gender got higher. It is because the phenomenon of low fertility is a consequence which appear when the gender relation such as the family structure around the partnership and labor market, and social system as well as the partnership between a man and a woman are complexly connected(Lee Jae Kyung et al, 2005). The bigger difference of gender equality between the formal and institutional aspect and practical aspect there is in a society, the clearer the tendency of low fertility appear(McDonald, 2000).

According to a result of an analysis, there is a negative relation between the wage rate of women by the region and

fertility level. Namely, it means that fertility level is high in a region with the big wage difference between men and women, while fertility level is low in a region with the small wage difference between men and women. The occupational segregation index by gender showed the negative relation with the fertility level. There was the low level of fertility in a region with the severe occupational segregation. Therefore, the result of an analysis shows that the effect of the structural context, which are represented by the gender wage gap and occupational segregation by the gender in the local labor market, affect fertility level significantly in the statistics.

It could be viewed that women give up their childbirth more in a region with the small wage gap than in other regions because the opportunity cost of childbirth is very high. This is the way of explaining suitable for the case that other effects of the labor market are fixed. With considering the structural context, however, it is interpreted that the level of fertility appears low because the system of the labor market is unfavorably set up for the reconciling work and family life. In other words, the region does not establish the opportunity structure which women could use the institutions for reconciling work and family life and proper child care service. Therefore, they could not give up the state of employment in a region with a small wage gap, so the fertility in the region maintains low level.

The occupational segregation is related to the phenomenon that female workers are crowed into some occupations with the low wage and dignity. The labor market had been adapted and institutionalized for male workers as the Korean society had traditionally been a nation with the low labor force participation of women. However, there is a high possibility of coming into conflict with the system of the male-centered labor market as women's economic activities had been enlarged. The first object of labor market flexibility is women whenever there is an economic crisis, the feminization of the irregular employment in labor market become accelerated on all such occasions.

It is construed that women's expectations about the marriage, pregnancy, and child birth would be discouraged and thus this led to a drop in the fertility level as women become concentrated on occupations with the low wage and unstable employment in a region in which the opportunity structure is exclusive by the occupation.

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Potential Institutional Accommodations in the face of Low Fertility

Ronald R. Rindfuss[1)]

Basic question I'll address

- Background: currently, South Korea has one of the world's lowest fertility rates and its population is rapidly aging.
- Question: what kind of institutional and policy change might work if South Korea desires to increase its fertility level, based on evidence from other countries?

1) Senior Fellow at East-West Center

Topics to be covered

1. Fertility measures
2. Reasons for increase in AAFB
3. Difficulty in evaluating policy effects
4. Institutions and policies
5. Intentional fertility policies
6. Inadvertent fertility policies

Countries to be covered

- Low fertility countries, basically those that have had replacement or lower fertility for a generation
- These also tend to be the richest, more economically developed countries
- Basically, Europe, North America, East Asia, Australia and New Zealand

Total Fertility Rate (TFR)

- Most commonly used fertility measure
- It is a period measure, not a cohort one
- Influenced by tempo and quantum factors
- In words: the number of children an average woman would have in her lifetime if she bore children at the rate prevalent in the period measured.

Total Fertility Rate (TFR), cont.

- "replacement rate" = ~ 2.1
- Once positive population momentum works its way out of the age structure, then countries below 2.1 start losing population (in the absence of in-migration)
- Germany, Japan and others are now losing population
- Below 2.1 leads to an "aging" population

TFR variation: Selected Countries

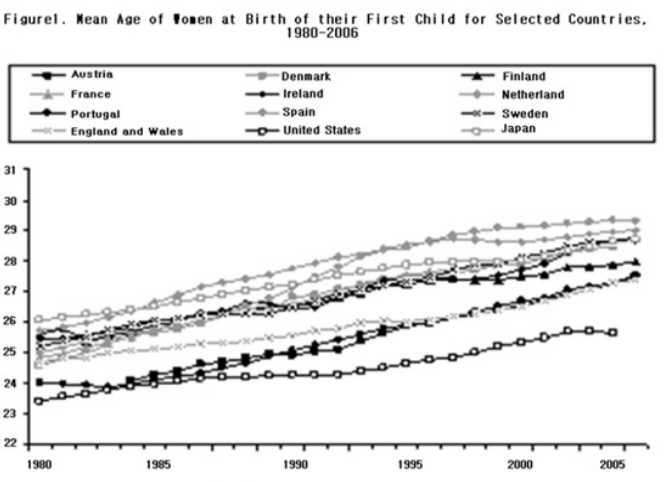
- TFR< or = 1.4: Austria; Germany; Hungary; Italy; Japan; Portugal; Spain; South Korea
- TFR 1.5 – 1.7: Belgium; Canada; Lithuania; Luxembourg; Netherlands; Switzerland
- TFR 1.8+: France; Iceland; Ireland; New Zealand; Norway; U.K.; U.S.
- Considerable variation!
- Source: http://www.prb.org/pdf10/10wpds_eng.pdf

Some empirical regularities

- Later timing of childbearing, higher proportion childless
- Interval between the first and second birth is relatively short for closed intervals
- Except in countries with a long communist history, most who have a first birth have a second birth
- So I will focus primarily on the timing of the first birth (AAFB).

Mean Age at Childbearing;2004; selected countries

- Increased in all countries
- Relatively late for all countries
- Eastern Europe has the lowest mean age at first birth.



Evaluating policy effectiveness: a high degree of difficulty

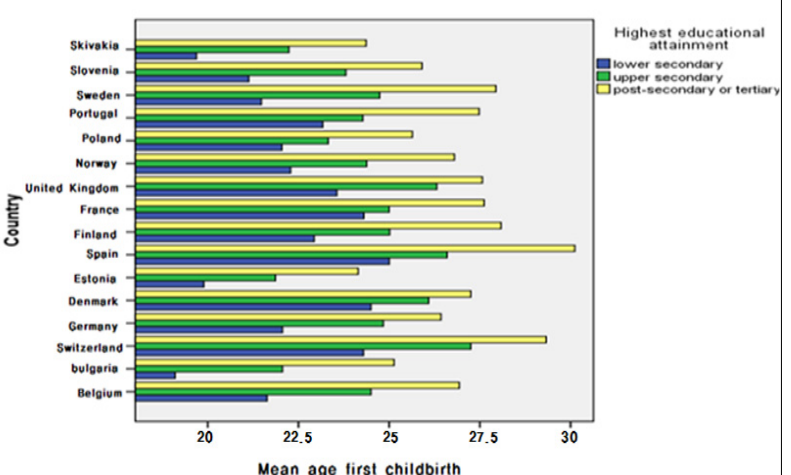
- Experiments tend not to be used, for ethical, political and practical reasons
- Country, rather than provincial, level policies (Thus tends to be a constant within a country and not visible if just studying one country)
- Confluence of a country's policies and its culture & ideology, which is difficult to disentangle

Disclosure

- I know some things about Korea, but I am not an expert. So from time to time I will ask for help from the Korean experts.
- I do know that AAFB has risen steeply in Korea, but do not know its current value

Positive correlation between educational attainment and AAFB

FIGURE 3 Mean age at first birth by educational level, women born 1960–69, selected European countries



source : European Social Survey, 2006, women only, born 1960–69, N=7,307, calculations by authors.

Why the increase in age at first birth? Some broad reasons

- Educational attainment levels have increased in all countries (Dramatically in Korea); in many countries, female educational attainment is higher than male's
- Increase in female labor force participation, especially a preference "career" type jobs
- Extended period of post-adolescence dependency
- And in some countries, a lack of movement towards gender equity (in the labor market and within the household).

Basic Sociology – a review

- **Institutions** are the set of norms or rules, formal and informal, which guide relationships among role occupants in areas of structured social interactions. Institutions influence social relations among people.
- Examples: housing market, labor market, educational systems.

Basic Sociology – a review, cont.

- Policies are formal norms or rules within institutions
- Policies can influence AAFB intentionally or inadvertently. Inadvertent AAFB policies have received little research attention.
- We'll discuss intentional policies first.

Do institutions matter?

- The next two slides show that the relationship, at the country level, between female labor force participation rates and fertility changed from being negative to positive between 1970 and 1990.
- Most argue that this change occurred because of differing institutional responses across countries to the universal rise in female labor force participation.

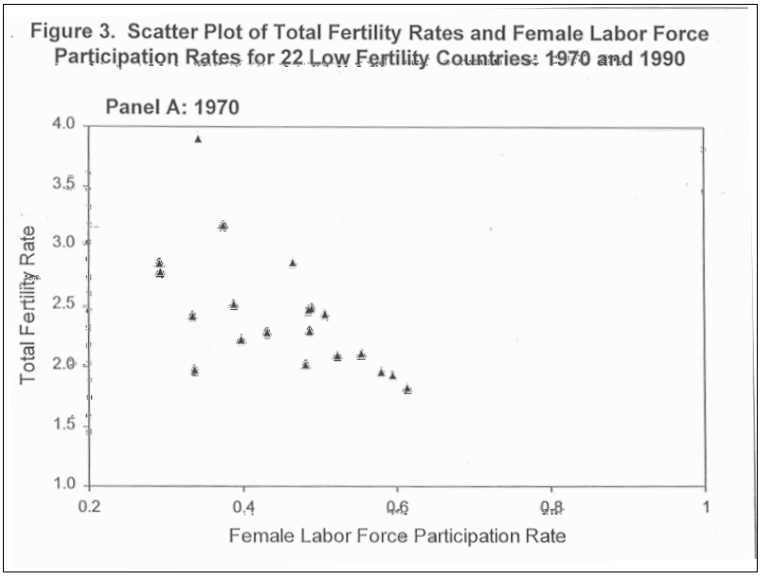


Figure 3. Scatter Plot of Total Fertility Rates and Female Labor Force Participation Rates for 22 Low Fertility Countries: 1970 and 1990
Panel A: 1970
Total Fertility Rate
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.2
0.4
0.6
0.8
1
Female Labor Force Participation Rate

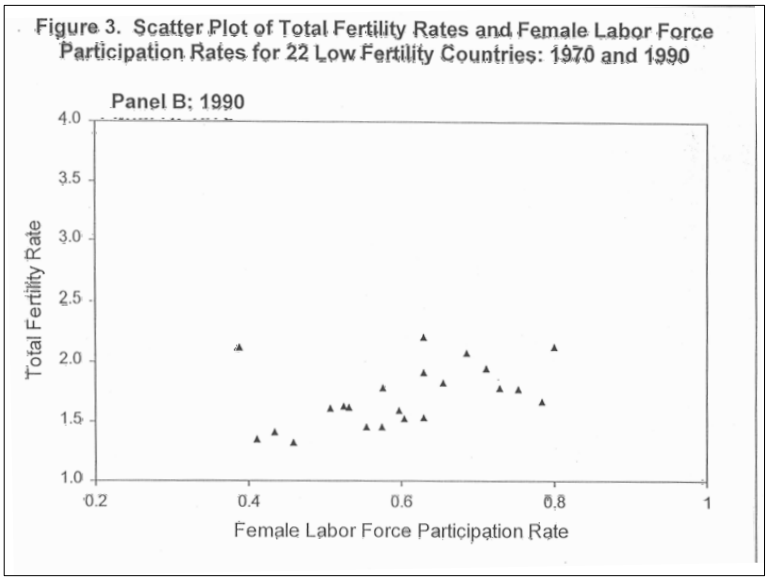


Figure 3. Scatter Plot of Total Fertility Rates and Female Labor Force Participation Rates for 22 Low Fertility Countries: 1970 and 1990
Panel B: 1990
Total Fertility Rate
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.2
0.4
0.6
0.8
1
Female Labor Force Participation Rate

Do institutions matter, cont.

- What happened?
- My read: in some countries it was (or became) easier to combine the worker and mother roles; in other countries, women needed to choose between one or the other.

Evaluating policy effectiveness: a high degree of difficulty

- Experiments tend not to be used, for ethical, political and practical reasons
- Country, rather than provincial, level policies (Thus tends to be a constant within a country and not visible if just studying one country)
- Confluence of a country's policies and its culture & ideology, which is difficult to disentangle

Policy evaluation, cont.

- A policy's effect might only occur in the long run
- Degrees of freedom problem, that is, relatively few countries available for statistical analysis

Policy evaluation, cont.

- Upshot:
- Need a healthy skepticism regarding currently published evaluations
- A shaky empirical foundation on which to provide advice to policy makers
- Considerable speculation exists in the research literature

Intentional AAFB or overall fertility policies

1. Direct cash payments

- Examples: baby bonus, family allowances
- Evidence on success: at best, mixed. Current conventional wisdom is that they have little effect
- My read: most studies have been of questionable quality, but it is unlikely that direct cash payments will have a large impact on AAFB. And a certain irony that direct cash payment policies are discussed/promoted in the least gender equity countries

Intentional AAFB or overall fertility policies, cont.

2. Indirect transfers

- Example: tax exemptions for families with children, health insurance benefits for families with children
- Note: Sometimes these are inadvertent policies
- Evidence: Modest or no effects
- My read: Unlikely to have a big impact on AAFB

Intentional AAFB or overall fertility policies, cont.

3. Improve work-family compatibility

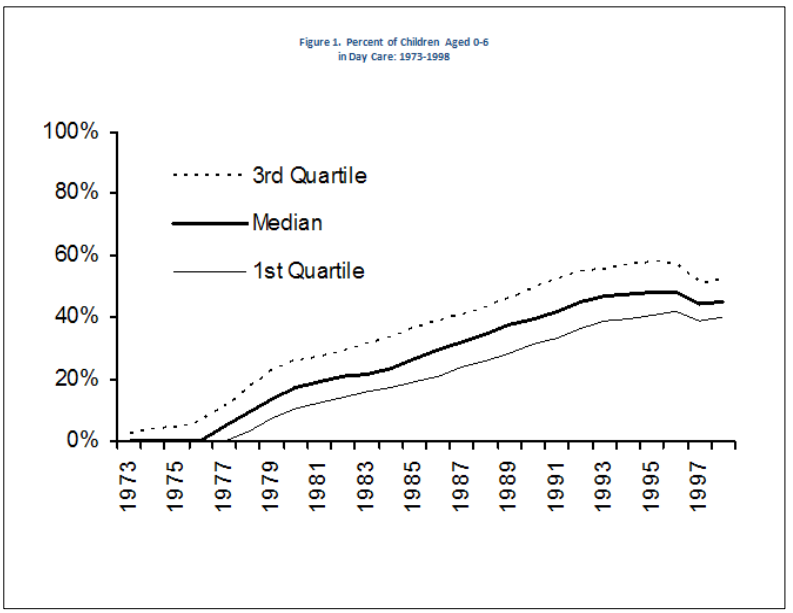
- Background: Sociologists talk about role incompatibility; economists talk about opportunity costs. Both getting at a similar issue: Today's jobs (and school) are incompatible with taking care of a child, especially a very young child. Workplaces have changed. Parenting demands have changed.

Intentional AAFB or overall fertility policies, cont.

- Examples: maternity & paternity leave with or without salary maintenance, provision of child care
- Evidence: In general, lowering the incompatibility between the mother and worker roles leads to a younger AAFB and higher levels of childbearing. (Very long maternity leaves seem to be an exception.)

Intentional AAFB or overall fertility policies, cont.

- Child care availability – I will give some evidence from my research in Norway
- I can give you a copy of the paper if you would like one



Statistical Specification of the Model

- (I'll not describe in detail today unless there are questions)
- Discrete-time hazard model to estimate age at first birth & timing of subsequent births.
- & a simulation model to estimate CEB by age 35
- Effects of child care availability & other variables can vary by birth interval

Statistical Specification, cont

- Control for unobserved heterogeneity using a non-linear variation of the Heckman-Singer procedure
- Municipality fixed effects are included to control for a) idiosyncratic placement of child care facilities and b) selective migration to places with better child care availability

Actual CEB for studied cohorts=1.85

Table 1. CEB by level of day care – results from simulations based on fixed-effects model

- 0% 1.51
- 10% 1.62
- 20% 1.74
- 30% 1.85
- 40% 1.97
- 50% 2.08
- 60% 2.18

Effect of increasing child care availability from 0% to 60%

- About 0.67 children – a large effect & our sensitivity tests suggest that it is believable.
- In an attempt to reduce work-family conflict, starting December 2008 Germany embarked on a Scandinavian-style policies. The policies are expensive & it will be a while before we know if the German experiment works.
- What is the child care situation in South Korea? What are the prospects for making it more widely available during normal working and commuting hours?

Intentional AAFB or overall fertility policies, cont.

- My read: The evidence is strongest that high quality child care that is available, acceptable, accessible and open during normal working & commuting times decreases AAFB and increases overall fertility.

Policies with inadvertent effects on AAFB

- Here we are speculating. There has been relatively little empirical work confirming these effects. Housing policies have received the most attention.

1. Housing. General hypothesis is that anything that makes it easier for young adults to obtain their own dwelling unit will lead to younger AAFB.

Policies with inadvertent effects on AAFB, cont.

- Background: countries differ markedly on the percent of down payment needed to obtain a mortgage, price of housing, size of rental market, availability of credit reports, and the ease of foreclose.
- Example: in Italy, large down payments (40-50%) are required, credit histories are not widely available, and foreclosures cannot be enforced until 48 months after mortgage payments have ceased.

Policies with inadvertent effects on AAFB, cont.

- Evidence: Relatively weak, but consistently showing a positive association between ease of obtaining a dwelling unit and TFR.
- My take: the hypothesis is intuitively plausible and likely true.
- What is the current situation in South Korea regarding mortgage availability, down payments, availability of credit reports, availability of affordable & decent rental housing?

Policies with inadvertent effects on AAFB, cont.

2. Educational systems: a) are primary school hours compatible with balancing work and family responsibilities. If not, AAFB is likely to be later. b) Is it feasible to return to school after having dropped out? If not, AAFB likely to be later.

- Evidence: not much
- My take: both are likely true
- South Korea? After-school schools, difficult to return after dropping out, very high percentage going to college/university – all antinatalist

Educational systems, some examples

- Differ in age at entry, tracking, ease of re-entry, and role played in matching graduates to jobs
- US, Norway, New Zealand have relatively easy ed re-entry (N; 1/5 post-parent ed)
- Japan & Germany difficult educational re-entry
- (Note which have high & low fertility)

Policies with inadvertent effects on AAFB, cont.

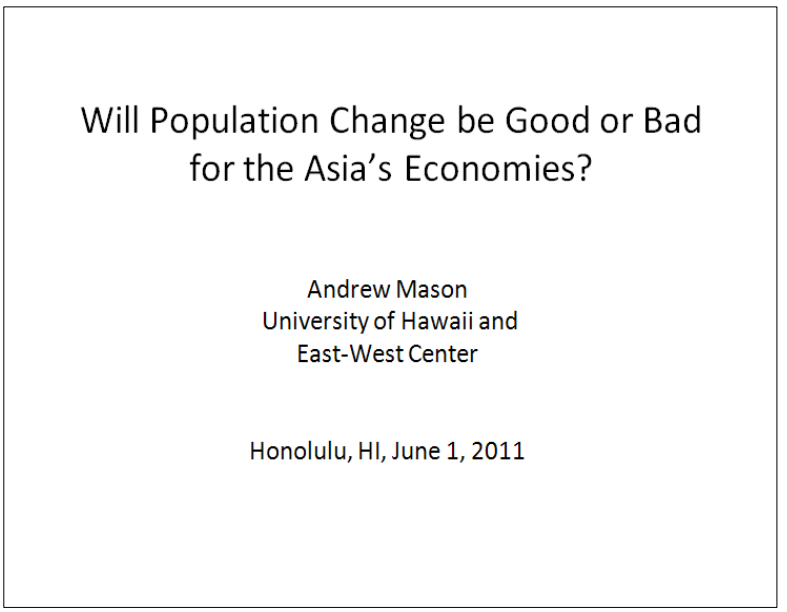
- 3. Job market: Institutional factors that lead to high youth unemployment likely lead to later AAFB.
- Evidence: extremely limited, but supportive of the hypothesis.
- My take: the hypothesis is intuitively plausible and likely true.
- What is the situation in South Korea?

Labor markets, some examples

- (current recession could change things)
- Spain, Italy, Greece – high degree of protection of current employees (Japan did but changing)
- UK, US low degree of protection of current employees
- Degree of job protection affects employers willingness to add new employees
- Southern Europe – about 40% unemployed or inactive 5 years after finishing school

Will Population Change be Good or Bad for the Asia's Economies?

Andrew Mason[1)]



1) Senior Fellow at the East-West Center

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  - Research teams in 35 high- and low-income economies
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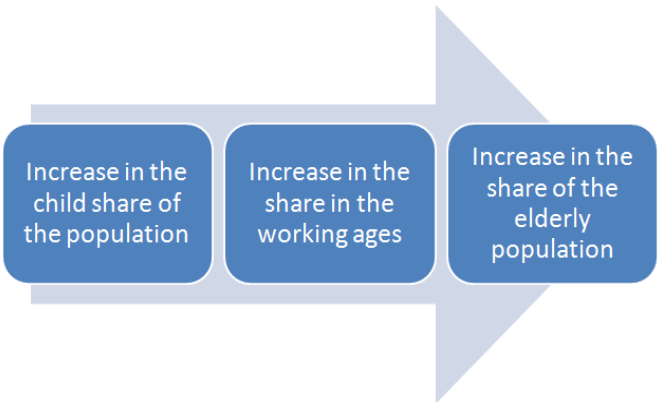
  - United Nations Population Fund (UNFPA)
- Draws on Lee and Mason 2011 forthcoming *Population Aging and the Generational Economy*
- Population data from UN *World Population Prospects.*
- *Draws on seminar Ron Lee and I presented at the Woodrow Wilson International Center for Scholars earlier this year.*

Andrew Mason, May 17, 2011 2

Three Phases of the Global Age Transition



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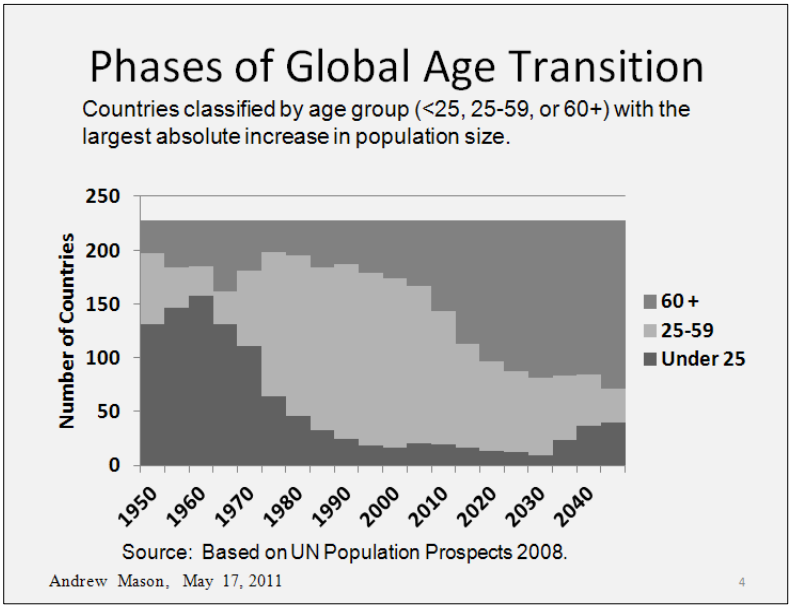
Phases of Global Age Transition
Countries classified by age group (<25, 25-59, or 60+) with the largest absolute increase in population size.
Number of Countries
250
200
150
100
50
0
1950
1960
1970
1980
1990
2000
2010
2020
2030
2040
60 +
25-59
Under 25
Source: Based on UN Population Prospects 2008.
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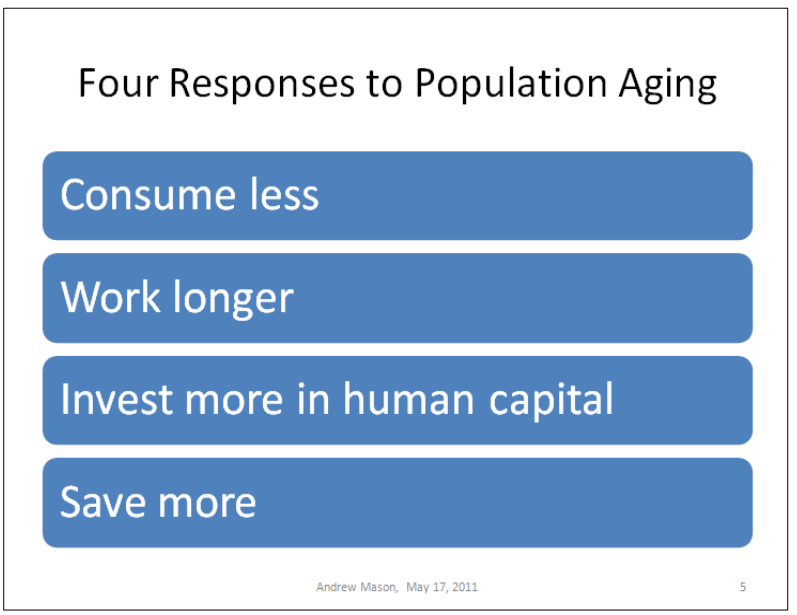
4


Four Responses to Population Aging
Consume less
Work longer
Invest more in human capital
Save more
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5

Consume less

- Maintain current rates of saving
- Current work effort
- Reduce consumption at every age to offset the decline in the support ratio

Definition of support ratio:

$$\frac{\text{Effective number of producers}}{\text{Effective number of consumers}}$$

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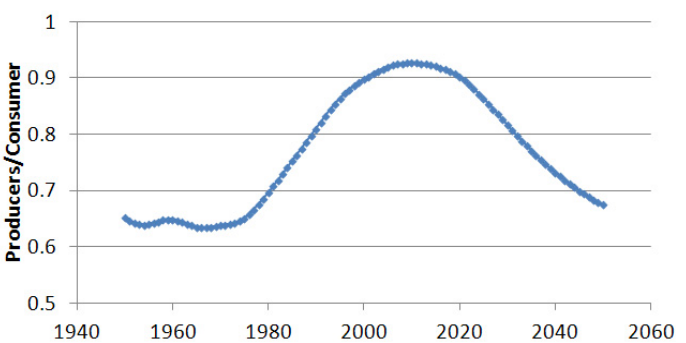
Support ratio, Korea, 2000



Note: Constructed using consumption and labor income profiles for four high income Asian countries.

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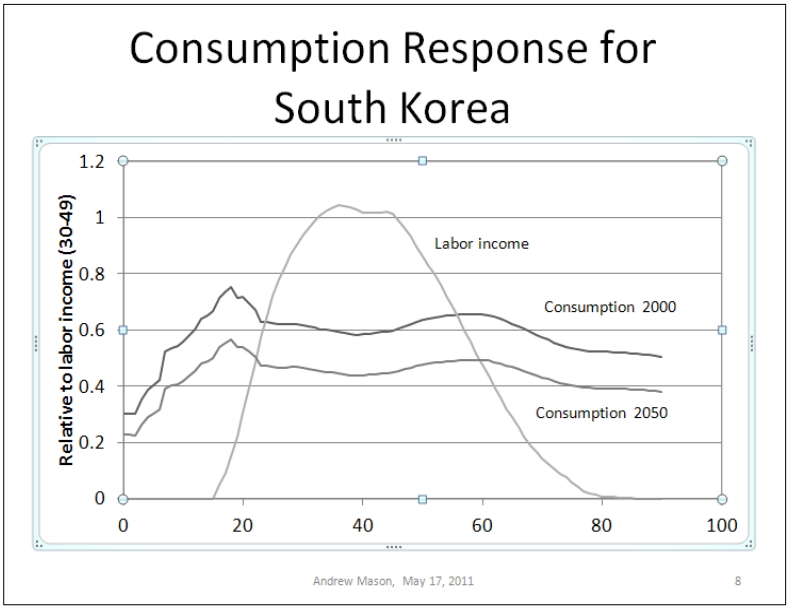
Consumption Response for South Korea
Relative to labor income (30-49)
1.2
1
0.8
0.6
0.4
0.2
0
0
20
40
60
80
100
Labor income
Consumption 2000
Consumption 2050
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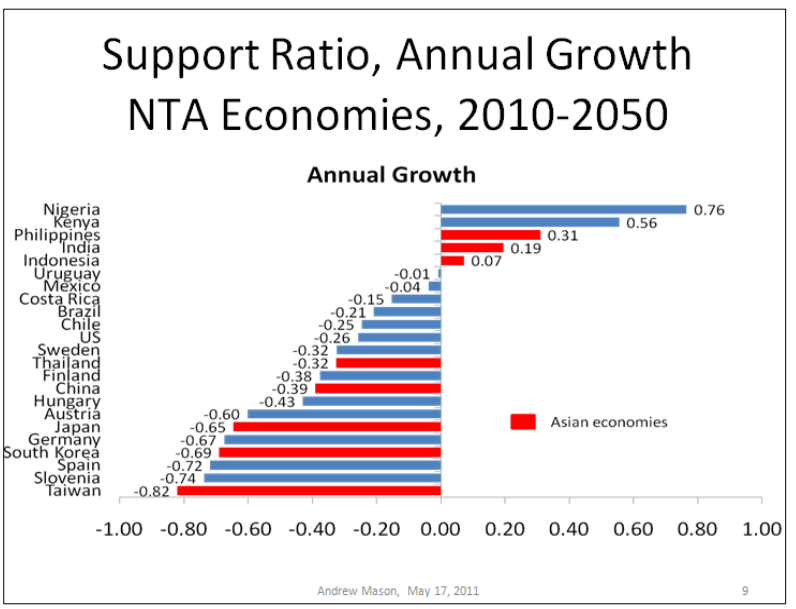
8


Support Ratio, Annual Growth NTA Economies, 2010-2050
Annual Growth
Nigeria 0.76
Kenya 0.56
Philippines 0.31
India 0.19
Indonesia 0.07
Uruguay -0.01
Mexico -0.04
Costa Rica -0.15
Brazil -0.21
Chile -0.25
US -0.26
Sweden -0.32
Thailand -0.32
Finland -0.38
China -0.39
Hungary -0.43
Austria -0.60
Japan -0.65
Germany -0.67
South Korea -0.69
Spain -0.72
Slovenia -0.74
Taiwan -0.82
Asian economies
-1.00 -0.80 -0.60 -0.40 -0.20 0.00 0.20 0.40 0.60 0.80 1.00
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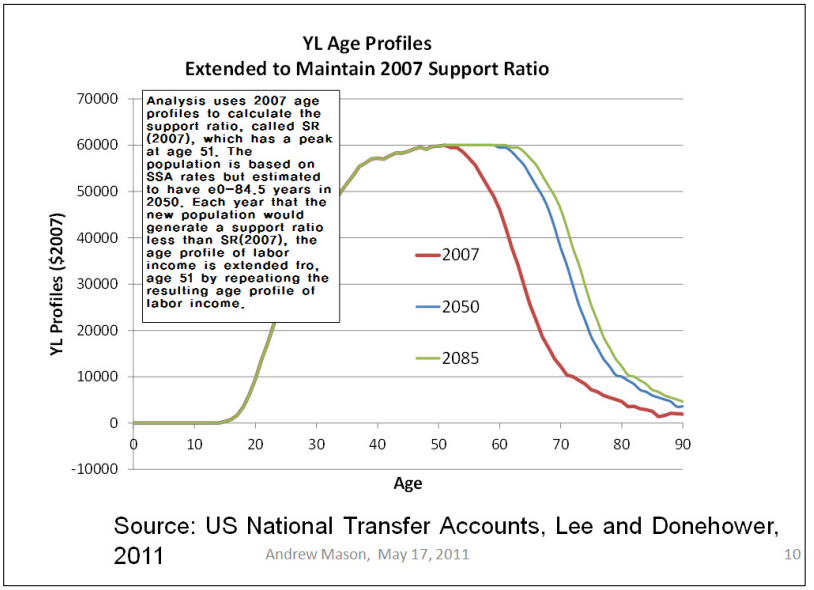
9


YL Age Profiles
Extended to Maintain 2007 Support Ratio
Analysis uses 2007 age profiles to calculate the support ratio, called SR (2007), which has a peak at age 51. The population is based on SSA rates but estimated to have e0–84.5 years in 2050. Each year that the new population would generate a support ratio less than SR(2007), the age profile of labor income is extended fro, age 51 by repeationg the resulting age profile of labor income.
YL Profiles ($2007)
70000
60000
50000
40000
30000
20000
10000
0
-10000
0
10
20
30
40
50
60
70
80
90
Age
2007
2050
2085
Source: US National Transfer Accounts, Lee and Donehower, 2011
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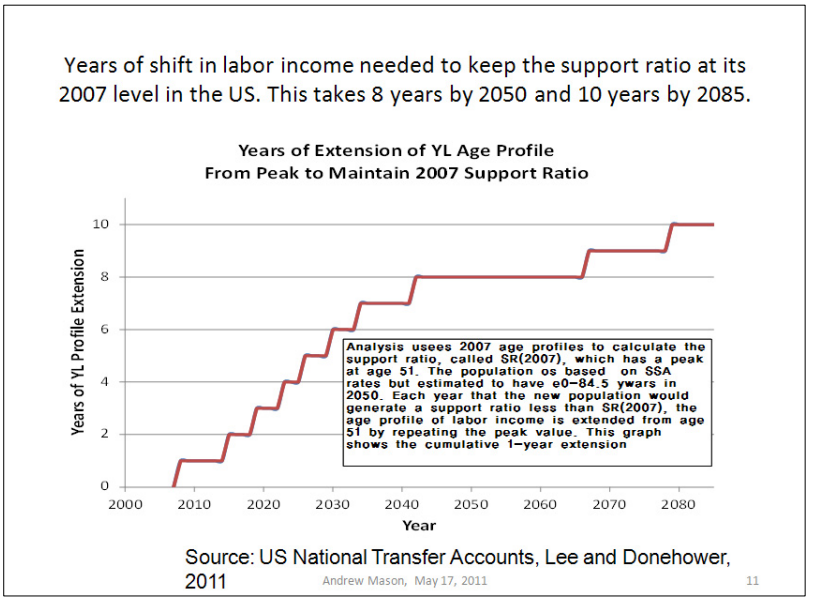
10


Years of shift in labor income needed to keep the support ratio at its 2007 level in the US. This takes 8 years by 2050 and 10 years by 2085.
Years of Extension of YL Age Profile
From Peak to Maintain 2007 Support Ratio
Years of YL Profile Extension
10
8
6
4
2
0
2000
2010
2020
2030
2040
2050
2060
2070
2080
Year
Analysis usees 2007 age profiles to calculate the support ratio, called SR(2007), which has a peak at age 51. The population os based on SSA rates but estimated to have e0–84.5 ywars in 2050. Each year that the new population would generate a support ratio less than SR(2007), the age profile of labor income is extended from age 51 by repeating the peak value. This graph shows the cumulative 1–year extension
Source: US National Transfer Accounts, Lee and Donehower, 2011
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11

Invest more in Human Capital

- Parents choose between number of children and amount to invest per child (Quantity-quality tradeoff)
- As economies develop parents opt for fewer children and spend more per child (Becker; Becker and Lewis, Willis).
- Aging (low fertility) will be accompanied by more human capital, regardless of causal direction.
- The human capital "response" helps to offset the negative effect of population aging on the support ratio.

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Investment in human capital

- NTA measures HK spending as sum of spending on health and education per child
  - at ages 0 to 17 for health
  - ages 0 to 26 for education
- Separately for public and private spending
- Express in years of labor income (30-49)

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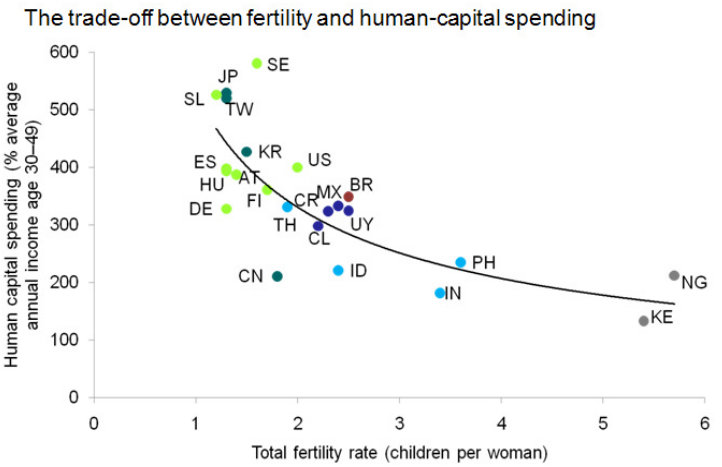

Human-capital spending on each child in low-fertility European countries and the US (light green) is about four times the average annual labor income of a prime-age adult. In high-fertility African countries (gray) spending is twice the average annual labor income.

Conclude: Population aging is accompanied by increased investments in HK per child

- Raises productivity and earnings of future labor force
- Substitutes HK for number of workers
- Higher productivity offsets falling support ratios.

Save More

- Assets generate income and if domestically invested they raise capital stocks and make labor more productive.
- Slower growth of population and labor force in an aging population mean that capital per capita or per worker can rise even if national saving rates fall.
- People accumulate assets over their adult lives so the elderly hold more assets than younger adults.
- In aging populations the proportion of wealth-holding elderly is higher, so there is more asset income and higher capital labor ratios.
- But if people expect to be supported by public or private transfers when they are old, this effect is muted.

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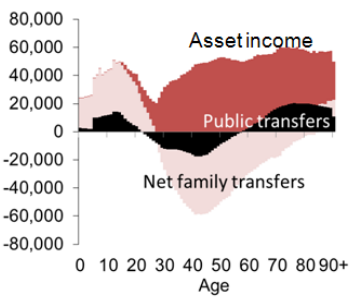
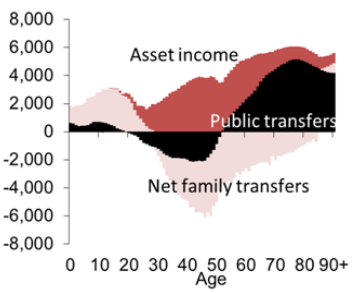
How net consumption is funded in Mexico and Brazil—in both, the elderly make large net transfers to younger family members

Mexican elders rely heavily on assets to fund their net consumption.



Brazilian elders rely heavily on public pensions to fund their net consumption.



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How is consumption by elderly financed?

- Elderly continue to work (not shown on previous chart)
- Elderly use asset income
- Elderly receive transfers
  - from family
  - from public sector
- Shares of labor income, asset income and transfers must add to 100%.

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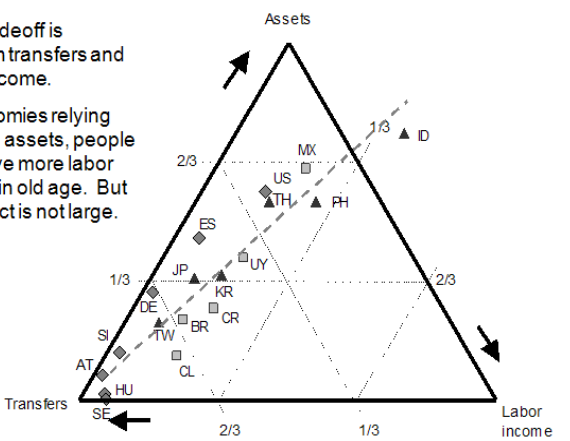
Funding consumption of the elderly in 17 economies around 2000:
Labor income, **Transfers** (public and private combined), and **Assets**

1) Main tradeoff is between transfers and asset income.
2) In economies relying more on assets, people also have more labor income in old age. But this effect is not large.



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Now look just at the part of consumption that is not funded by labor income.
That way we can show public and private transfers separately

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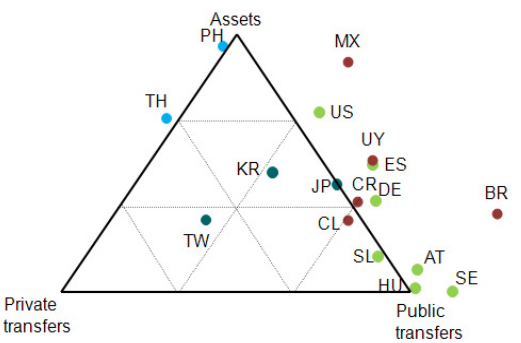
Funding the share of consumption not covered by labor income:
Family Transfers, Public Transfers and **Assets**



The elderly in European countries (light green) rely almost exclusively on public transfers for support. The elderly in the Philippines (PH), Mexico (MX), Thailand (TH), and the US rely heavily on assets. Few rely on private transfers. In countries to the right of the triangle, the elderly actually give more to their families than they receive.

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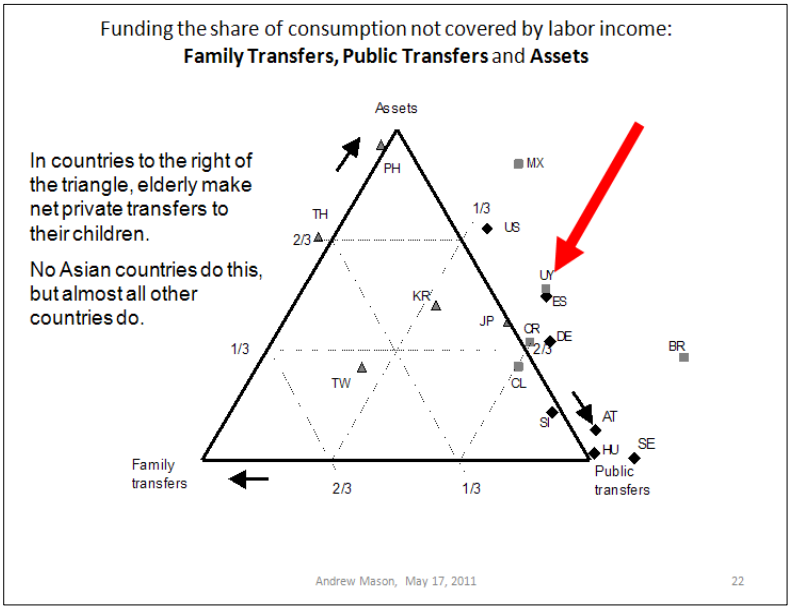
Funding the share of consumption not covered by labor income:
Family Transfers, Public Transfers and **Assets**
In countries to the right of the triangle, elderly make net private transfers to their children.
No Asian countries do this, but almost all other countries do.
Assets
PH
MX
TH
1/3
2/3
US
UY
ES
KR
JP
CR
DE
2/3
BR
1/3
TW
CL
SI
AT
HU
SE
Family transfers
2/3
1/3
Public transfers
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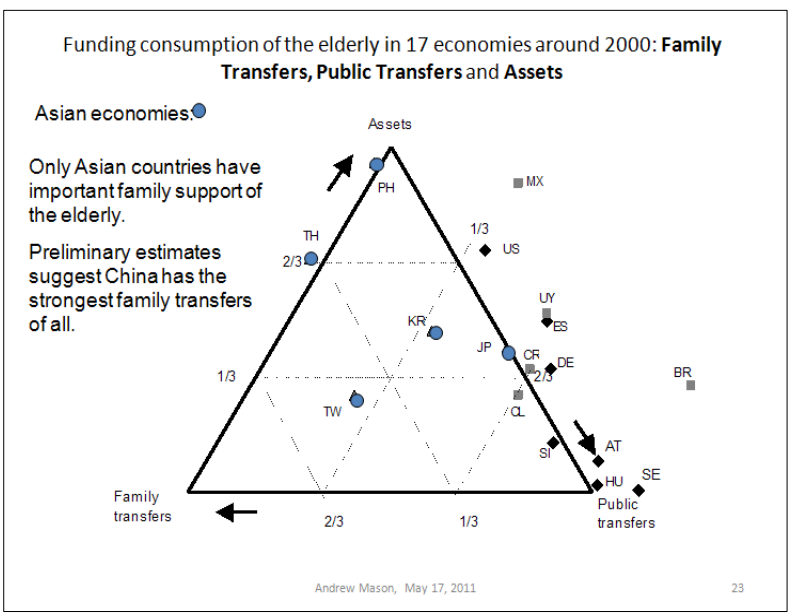
22


Funding consumption of the elderly in 17 economies around 2000: **Family Transfers, Public Transfers** and **Assets**
Asian economies:
Only Asian countries have important family support of the elderly.
Preliminary estimates suggest China has the strongest family transfers of all.
Assets
PH
MX
TH
1/3
2/3
US
UY
ES
KR
JP
CR
DE
2/3
BR
1/3
TW
CL
SI
AT
HU
SE
Family transfers
2/3
1/3
Public transfers
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23

Implications for capital accumulation

- Population aging raises the need to fund the old age deficit.
- If need is met by asset accumulation, then population aging raises asset income and perhaps labor productivity.
- If met by public or private transfers, then population aging just raises the transfer burden on workers.

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Conclusions

- Population aging will depress support ratios
  - Especially in East Asia
- Four possible responses
  - Allow consumption to decline
  - Increase work effort
  - Invest more in human capital
  - Increase saving

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Conclusions

- Consumption decline
  - Would be very substantial
  - Offset to some extent by non-demographic factors but ageing would be a major drag on growth
- Increase labor income at older ages
  - Offset to population aging is possible and an appropriate response
  - Full offset not very realistic

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Conclusions

- Increase human capital investment
  - Appears to be more or less automatic
  - Very promising if investment in education is successful, i.e., continues to yield high returns
- Higher saving
  - Requires slower growth in consumption in the short-run
  - Leads to more rapid economic growth and higher sustained consumption in the long-run

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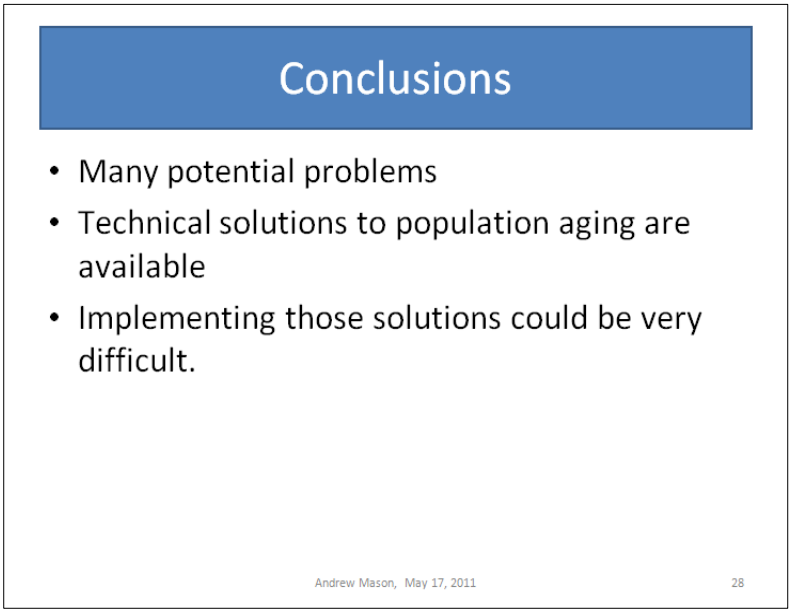
Conclusions
• Many potential problems
• Technical solutions to population aging are available
• Implementing those solutions could be very difficult.
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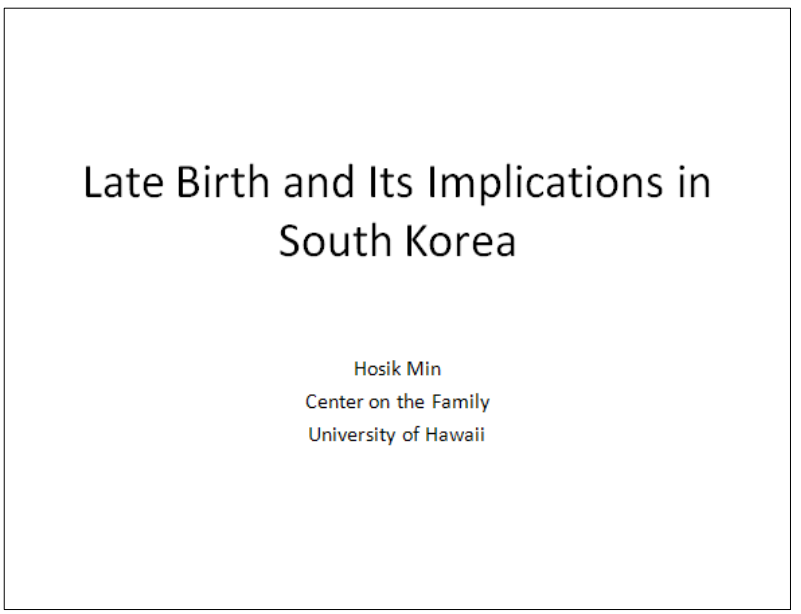
28

Late Birth and Its Implications in South Korea

Hosik Min[1)]



1) Demographer, Center on the Family Univerity of Hawaii

Table 2. Number of Births by Mother's Age Cohort in 2008 and 2009

(Thousand)

	15-19	20-24	25-29	30-34	35-39	40-44	45-49
2008	2.8	28.2	168.9	198.7	59.6	6.5	0.4
2009	2.8	24.9	155.9	192.1	60.7	7.3	0.4
Difference	0.0	-3.3	-13.0	-6.6	1.1	0.8	0.0

- Increase in delivery after 35 years old; this trend has continued since 2003 (2009 National Statistics Office Report)

Table 1. TFR and Fertility Rate by Mother's Age Cohort (1981-2009)

(per thousand)

	TFR	15-19	20-24	25-29	30-34	35-39	40-44	45-49
1981	2.57	16.2	160.9	224.3	82.3	23.2	6.3	1.5
1990	1.57	4.1	82.1	167.1	49.6	9.4	1.5	0.2
2000	1.47	2.5	38.8	149.6	83.5	17.2	2.5	0.2
2009	1.15	1.7	16.5	80.4	100.8	27.3	3.4	0.2

- Increasing trend after 30 years old and over, while declining before 30 years old

- In 2009, the fertility rate by early 30's was the biggest

Trends of Late Birth

- The definition of Late Birth is not Certain: 30 years old and over vs. 35 years old and over
- General trends of late birth is continue to Increase by late marriage
- The age at first birth in 2009 was almost 30 years old (29.9 years old)

Current Research on Late Birth

- Mostly focusing on medical, educational, and psychological research

1) Medical research: health issues for mothers and infants
2) Educational and psychological research: childrearing, educating, parenting style, etc.

Research Demand for Late Birth

- No research directly on socio-demographic characteristics and factors
- Given the increasing trend of late birth (age after 30 years old; even after 35 years old), also this trend is expected to continue, a better understanding on late birth would be necessary and provide us meaningful Implications for public policy and social support

- To understand the late birth well, breaking down the late birth into two categories (early 30's and late 30's) and using the conventional socioeconomic theory on fertility (the higher the SES, the fewer children) would be useful
- The birth of the higher parity may present the reversed relationship between SES and fertility

- Conceptual framework to understand the late birth

Mother's age		First birth	Second birth
Early 30's	Marriage	Delayed marriage	
	SES & fertility	Negative	Maybe negative
Late 30's	Marriage	More delayed marriage	
	SES & fertility	Negative	Maybe positive?

• Early 30's

1) first birth: more likely to be the same as 20's (delayed marriage): expect to follow the conventional theory

2) second birth: follow the conventional theory (?)

- Late 30's:

1) first birth - more likely to be the same as 20's (more delayed marriage): expect to follow the conventional theory (the proportion of no child?)

2) second birth:

Short- and Long-term interval - sociodemographic characteristics and the proportion of all second birth is unknown; will it follow the conventional theory? Probably not. Are the characteristics of short- and long-term interval groups same?

- For the 2nd birth: Does SES make difference? Is it reversed the conventional theory? Seems like it does

1) 2010 Tax Return Statistics Report: the more children, the higher average earning

- Average Income with birth or adoption by age cohort ($)

	Total	20's	30's	40's	50's	60's +
With Birth/Adoption (a)	36,300	27,091	36,545	45,182	49,636	48,364
Without Birth/Adoption (b)	23,500	13,182	23,727	30,000	29,818	16,091
Ratio (a/b)	1.5	2.1	1.5	1.5	1.7	3.0

2) Son's study (2009):

- Data: conventional sampling (74 couples in Seoul who had a birth after 35 years old)

- Findings:
  - 79.7% of them planned a birth
  - 51% of them has a sibling
  - a mean duration was 65 months (with s.d. 40, minimum 18, maximum 174)
  - parents were financially and economically secured (31% of them earned $4,540 as a monthly household income)

- The demographic characteristics of parents in Son's study

	Father	Mother
Average Age (current)	44.4 (3.22)	42.4 (2.56)
Average Age (at birth)	39.7 (3.07)	37.8 (2.28)
Education (college +)	68.4 %	71.7%
Occupation (professional)	21.6%	13.5%
Occupation (CEO)	2.7%	1.4%

*Note: ( ) is standard deviation

- Other question: do people with two or more children solve the problems? Child-caring and -rearing, cost of education?

Questions for Further Research

- By understanding of late birth, we may answer several questions regarding having more children

1) Need to know the sociodemographic characteristics of parents who had two or more children: their patterns and trends

2) How they solve the hindering factors to have more children?

3) Whether SES is the main factor for having more children

4) If 1 is yes, the way of how the conventional theory works would be reversed

- Need to develop appropriate public policy and social support based on these answers

The Rise of Temporary Migration of Rural Married Women and Its Effect on Non-Farm Employment for All Temporary Migrant Rural Women in China, 1990-2005

Jiajian Chen[1)], Robert D. Retherford[2)], Minja Kim Choe[3)], Xiru Li, Hongyan Cui


The rise of temporary migration of rural married women and its effect on non-farm employment for all temporary migrant rural women in China, 1990-2005

Jiajian Chen, Robert D. Retherford, Minja Kim Choe, Xiru Li, and Hongyan Cui

Presentation prepared for the Second EWC-KIHASA Joint Conference on Low Fertility and Population Aging Honolulu, June 1, 2011

1

1) Senior Fellow at the East-West Center
2) Coordinator of Population Health Research at the East-West Center
3) Senior Fellow at the East-West Center

The great internal migration in China

- China's internal migration surged sharply during the economic and demographic transitions.
- China's migration has been the largest and most mobile labor migration in world history.
- It contributes to a profound social transition from a predominantly agricultural society to an urban one dominated by industry and services.

2

Most of China's internal migration is a temporary flow of rural labor to urban areas

- The rural economic reform demolished the commune system and freed the surplus laborers from farm lands;
- Rural laborers can move freely to work in urban areas as "floating population" but cannot change their rural household registration (*hukou*) status;
- Temporary interprovincial migrants increased from 6 million in 1990 to 42 million in 2000 and 48 million in 2005, about 85% them have rural *hukou*.

3

Temporary migration of rural married women

- Temporary migrants used to consist of men and single women who work in export-oriented industry areas for short periods of time and eventually return to the village and stay there to work in agriculture after marriage.
- Recent evidence from small surveys shows that rural married women are increasingly migrating out with or without husband and children.
- However, findings based on small samples are only suggestive and need further assessment at national level.

4

Rural migrant women's employment status

- Rural migrant women's participation of non-farm work outside their home village is a necessary condition of improved status of rural women (Boserup 1970; Entwisle et al. 1995).
- Temporary migration of rural married women for economic opportunities is a relatively new phenomenon that has been called for attention internationally (UN 1993).
- Recent rise in temporary migration of rural married women and its effect on employment status of rural migrant women are understudied.

5

Objectives

- To assess recent increase in temporary migration of rural married women in China.
- To assess its effect on the changes in non-farm employment rates for all temporary migrant women of rural origin in China during 1990-2005.

6

Data

- The 1990 and 2000 censuses and 2005 mini-census.
- Data analyses are restricted to interprovincial migration only.

7

Definitions

- Prevalence of migration: proportion of population who are migrants in the last 5 years before the census.
- Rural population: people who have agricultural household registration (*hukou)* status regardless of whether they live in a rural or urban area.
- Permanent rural migrants: persons who have rural *hukou* in current province but resided in other province 5 years earlier.
- Temporary rural migrants: persons who have rural *hukou* in another province and have resided in the current province less than 5 years.

8

Definitions for migrant women

- Marital status:
  - Currently unmarried: single, widowed, and divorced
  - Currently married:
    - Marriage migrant: migration for marriage
    - Other married
- Education: Primary, junior high, senior high
- Province of destination:
  - Beijing, Shanghai, Jiangsu, Zhejiang
  - Guangdong
  - Other province

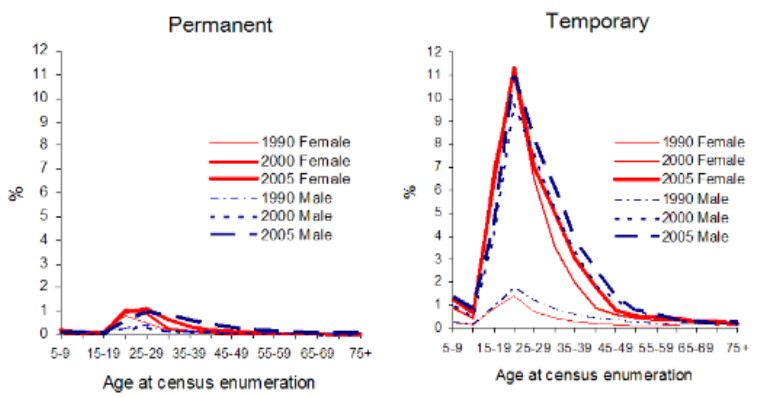
9

Method

- Das Gupta's cross-clarification decomposition model extended Kitagawa's decomposition method to allow decomposition of multiple variables.
- Chevan and Sutherland (2009) further extended the decomposition of difference between the crude rates into the sum of a compositional effect and a rate effect at both the category and variable level.
- Decomposition at category level of variable provides more useful information about the relationship among demographic measures than does at variable level only.

10

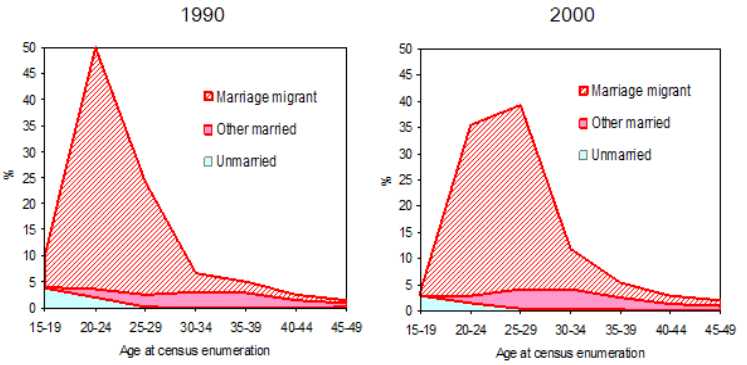
FIGURE 1 Age-specific prevalence rates of interprovincial migration among rural persons, by type of migration and sex, China, 1990-2005



Note: Rural persons are those with agricultural *hukou* at the time of the census, regardless of whether they live in a rural or urban area.

Data sources: Calculated from 1990, 2000, 2005 census samples.

FIGURE 2 Percent distribution of permanent migrant rural women by age and marital status, China, 1990 and 2000



Note: Rural women are those with agricultural *hukou* at the time of the census, regardless of whether they live in a rural or urban area.

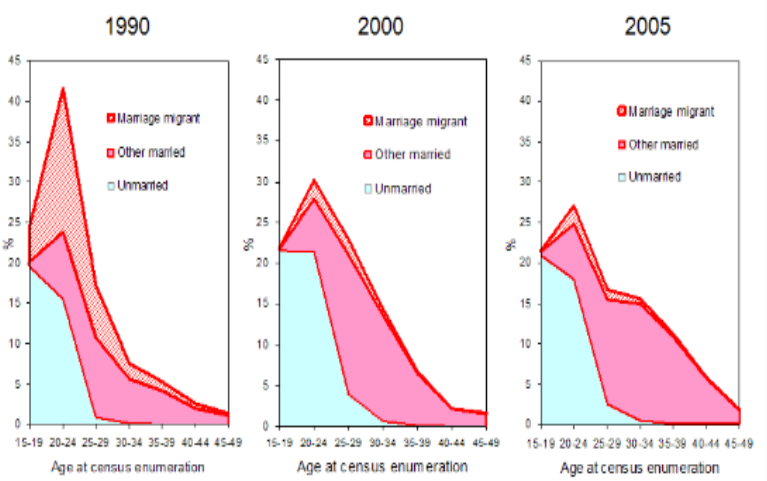
Source: Calculated from 1990 and 2000 census samples.

Percentage distribution of temporary interprovincial migrant rural women aged 15-34 and their non-farm employment rates by selected characteristics, China, 1990-2005

Characteristics	Percentage distribution		Non-farm rate (%)	
Categories	1990	2005	1990	2005
Total	100.0	100.0	50.0	81.1
Current marital status				
Not-married migrant	39.6	51.9	88.0	92.9
Marriage migrant	33.7	5.3	6.7	20.4
Other married migrant	26.7	42.8	48.4	74.5
Education schooling				
Primary	48.0	18.8	37.2	68.8
Junior high	46.2	67.9	62.7	84.2
Senior high	5.8	13.3	55.2	82.8
Province of destination				
Beijing, Shanghai, Jiangsu, & Zhejiang	20.1	36.8	51.7	79.0
Guangdong	28.2	43.4	82.6	91.5
Others	51.7	19.8	31.6	62.2
Sample size	15,437	26,967	15,437	26,967

Note: Total refers to all rural temporary interprovincial migrant women aged 15-34.
Source: China's 1990 census and 2005 mini-census.

FIGURE 3 Percent distribution of temporary migrant rural women by age and marital status, China, 1990 and 2000



Note: Rural women are those with agricultural *hukou* at the time of the census, regardless of whether they live in a rural or urban area.

Source: Calculated from 1990, 2000, and 2005 census samples.

Decomposition of the changes in the non-farm employment rate of temporary migrant rural women aged 15-34, China, 1990-2005

Variable Category	Decomposition (effect)	Percent decomposition
Total for composition	**23.0**	**73.9**
Current marital status	*12.8*	*41.0*
Not-married migrant	3.2	10.3
Marriage migrant	-3.5	-11.4
Other married migrant	13.1	42.1
Education schooling	*3.6*	*11.7*
Primary	-14.1	-45.4
Junior high	12.8	41.2
Senior high	5.0	15.9
Province of destination	*6.6*	*21.1*
Beijing, Shanghai, Jiangsu, and Zhejiang	11.7	37.5
Guangdong	8.7	27.9
Others	-13.8	-44.3
Total for rate	**8.1**	**26.1**
Current marital status	*2.7*	*8.7*
Not-married migrant	0.5	1.5
Marriage migrant	0.7	2.1
Other married migrant	1.6	5.1
Education schooling	*2.7*	*8.7*
Primary	1.3	4.0
Junior high	1.2	3.7
Senior high	0.3	0.9
Province of destination	*2.7*	*8.7*
Beijing, Shanghai, Jiangsu, and Zhejiang	0.7	2.3
Guangdong	0.4	1.4
Others	1.6	5.1
Total difference	**31.1**	**100.0**
From all variables	*31.1*	*100.0*
From all variable categories	31.1	100.0

Note: The crude rates increased by 31 percentage points from 50% to 81% during 1990-2005.

Summary

- Rural married women have increasingly migrated temporarily out of their provinces of rural origin to engage in non-farm work in urban areas.
- The rise in temporary migrant rural married women accounts for 47% of the overall increase in non-farm employment rates for all temporary migrant rural women during 1990-2005.
- The conventional pattern that few rural married women migrated and participated in non-farm work has changed in China during 1990-2005.

16

Conclusions

- The recent rise in temporary migration of rural married women for non-farm employment signals a new movement towards improving status of women in China.
- Temporary migration of rural married women often means leaving children behind and bearing psychic and social costs of family disruption.
- Policies towards temporary migrants should provide public supports to the family needs of temporary migrant rural mothers.

17

Appendix. Conference Agenda

The Second EWC-KIHASA Joint Conference on
Low Fertility and Population Aging
(Socioeconomic Impacts of Baby Bust)

June 1 -2, 2011

Center for Korean Studies Conference Room,
University of Hawaii

Coordinators: Minja Kim Choe, EWC and Sam-Sik Lee, KIHASA

Day 1, June 1, Wednesday

08:30~09:00	Registration
09:00~09:30	Opening Ceremony
	Moderator Dr. Robert Retherford
	Welcoming Remarks
	Center for Korean Studies (Dr. Yunghee Kim, Director)
	EWC (Dr. Nancy D. Lewis, Director of Research Program)
	KIHASA (Dr. Samsik Lee, Director, Aging and Low Fertility Research Division)
09:30~10:00	Coffee Break and Photo Session
10:00~11:30	Session I.

Moderator Dr. Nancy D. Lewis

Discussant Dr. Ronald Rindfuss

Dr. Samsik Lee, “Socio-economic Implications of Baby Bust in Korea”

Dr. Jiajian Chen, "The rise of temporary migration of rural married women and its effect on non-farm employment for all temporary migrant rural women in China, 1990-2005”

11:30~13:00 Lunch

13:00~14:30 Session II.

Moderator Dr. Hosik Min

Discussant Dr. Minja Kim Choe

Dr. So Chung Lee, “Old Age and Inequality : focusing on income and expenditure”(presented by Jihye Yi)

Dr. Andrew Mason, “Will Population Change Be Good or Bad for Asia’s Economies?”

14:30~15:30 Individual consultations

18:30~20:00 Dinner (Hosted by East-West Center)

Day 2, June 2, Thursday

08:30~10:00	Session III. Moderator Dr. Samsik Lee Discussant Dr. Jiajian Chen Dr. Yunkyung Lee, "Aging baby boomers and health care finances : National Health Insurance and Long-Term Care Insurance " Dr. Eun-Jung Kim, "The Baby Bust and Consumption Trends"
10:00~10:30	Coffee Break
10:30~12:00	Session IV. Moderator Dr. Eun-Jung Kim Discussant Emi Tamaki Dr. Hosik Min, "Late Birth and Its Implications in South Korea" Dr. Robert Retherford, "Explaining Trends in Coresidence of Newly Married Couples with Parents in Japan"
12:00~13:45	Lunch (hosted by KIHASA)
14:00~15:30	Session V. Moderator Dr. Samsik Lee Discussant Dr. Minja Kim Choe Dr. Jongseo Park, "Gender Inequality in Labor Market and Fertility" Dr. Ronald Rindfuss, "Potential Institutional Accommodations in the Face of Low Fertility"
15:30~16:30	Individual consultations