Recent Fertility Decline and Its Implication for Population Policy in Korea

Jungho Kim*†
Korea Development Institute

January 31, 2007

Abstract

This paper examines the demographic trend in Korea focusing on the period since 1985. It is suggested that the change in fertility and mortality is the main driving force for the aging structure of population. The continuing decline of fertility below the replacement rate is accompanied by the changes in the various aspects of fertility including the delay in marriage and childbearing, an increase in the childlessness and the movement toward the gender equity at birth. Introducing the concept of externality to childbearing, it is argued that the relevant policy question is not whether a government should promote childbearing but how much it should be willing to pay for the policy implementation. A simple exercise suggests that the largest part of the externalities to childbearing are generated through the national defense and the intergenerational transfer.

Keywords: Fertility, Aging, Population Policy and Korea.
JEL Classification Number: J11, J18, O20.
1 Introduction

Korea experienced a dramatic economic development over the last 40 years. The Gross Domestic Product (GDP) per person was 1,912 US dollars in 1970, and it increased by more than six fold to 12,752 US dollars in 2004 (Figure 1).\footnote{The GDP per person is in terms of 2000 constant US dollars.} The economic development transformed a traditional society to a modern one in every aspect of life.

One of the prominent changes was that of fertility. The period Total Fertility Rate (TFR), which can be interpreted as the expected number of children for an average woman, was 4.53 in 1970, and reached the replacement level of 2.08 in 1983, and continued to decline to 1.08 in 2005 (Figure 1). In his analysis of the demographic transition, Kim (2004) distinguished the second fertility transition (1985 to present) from the first fertility transition (1960 to 1985). The first fertility transition is characterized as the period of rapid fertility decline, modernization, economic development, urbanization, and family planning programs. The second fertility transition is explained as a period of a continuing decline of fertility below the replacement rate, social development, globalization, gender equity and expansion of medical insurance.

Economic theories of fertility predict that fertility declines with economic development in a number of ways. A higher level of income may be associated with a stronger preference on the quality of children over the quantity suggested by Becker and Lewis (1973). The households with higher income may also face higher cost of female time either due to higher female wage rate or due to an increase in the value of womens time spent at home (Willis 1973). The availability of modern contraceptives may enable couples to control the number of children and the timing of childbearing better as they desire. With the child mortality rate decreasing, households may not have to hoard more children than they desire for fear of infant deaths (Schultz 1997). As the financial market is developed, parents may find a various ways of saving for their old age other than investing in their
Figure 1: Economic Development and Fertility Decline in Korea

Notes:
1) Data Source: Korean Population Censuses in selected years (Korean Statistical Information System, i.e. KOSIS), World Bank
2) The GDP per person is in terms of constant 2000 US dollars.
3) The total fertility rate (TFR) measures the period TFR.
children (Schultz 1997). Unfortunately, however, the empirical finding for these hypotheses in case of Korea is limited.

The fact that the fertility rate continues to decline well below the replacement level prompted many researchers and policy-makers alike to worry about the consequences of aging society and shrinking population. Even though having children is an individual choice, the aggregate change in fertility rate leads to a change in the age structure of population, which has serious consequences including the balance of fiscal revenue and expenditure.

The purpose of the paper is to describe the recent change in the age structure of population in Korea and to discuss the direction of relevant research for mitigating its consequences. In particular, the paper focuses on the demographic changes over the last 20 years.

The proportion of working population in Korea increased monotonically over the last half a century, but is expected to decrease in the near future. The components of this change of age structure of Korean population include the fertility decline, longer lives and net immigration. The comparison of the magnitudes of these three forces suggests that the aging society is mainly due to fertility and mortality.

The fertility decline since 1985 seems to be driven by both the decrease in the number of lifetime births and the delay of childbearing. It was suggested that the recent decline of fertility is due to the changes in the economic variables like income, female wage, the cost of education rather than the access to modern contraceptives (Kim and Kim 2004, Kim et al. 2006).

The life expectancy has been almost linearly increasing since 1970, and is expected to continue its trend. The increase in income, the rise in the value of time, the higher return to human capital, and the advance in the medical technology are considered as the main causes for a decrease in the level of mortality.

2The Korean family planning program was abolished in 1996.
Given that it is a human desire to try to live longer and that the flow of immigration is limited, the fertility rate is left as the only target by policy tools designed to affect the age structure of population. Discovering the increasing burden of working population to finance the public services for the young and the old as the society is aging, many policy makers and researchers alike argued the promotion of childbearing and proposed various policy options. The relevant question, however, is not whether the government should promote childbearing, but how much it should be willing to pay for an additional child. The gap between individual and public incentives for having children is called the externality of childbearing, and the goal of population policy should be to fill this gap by introducing the exact amount of incentives (Lee 1990). A simple exercise suggests that the largest part of the externalities to childbearing are generated through the national defense and the intergenerational transfer in Korea.

The rest of the paper is organized as follows. Next section explains the change of age structure of Korean population and its pace. Section 3 explores the various aspects of fertility decline. Section 4 shows the trend of mortality. Section 5 introduces the flow of migration. Section 6 discusses the population forecasting and its limitations. Section 7 provides a simple analysis measuring the externality of childbearing. Section 8 makes a concluding remark.

2 Age Structure of Population

The age and sex structure of a population can be clearly displayed by the age pyramid. The each bar in a pyramid indicates the proportion of an age-sex group to the total population. As can be seen in the panel (a) in Figure 2, the age pyramid in 1955 exhibits a triangle shape under a high fertility and high mortality regime. Since then, the declining fertility and mortality has been lowering the proportion of the young population (age under 15) and increasing that of the old population (age above 64). In 2035, the age pyramid is projected to have a shape of a reverse
The age structure of a population is closely linked to the population growth. The age pyramid in 1955 reflects the high rate of population growth in 1955 (3.1 percent), and those in 1985 and 2005 imply a positive but low growth rate (1.2 percent and 0.4 percent, respectively). The age pyramid in 2035 corresponds to a negative population growth (-0.4 percent).

**Figure 2: Age and Sex Structure of Population**

(a) 1955  
(b) 1985  
(c) 2005  
(d) 2035

**Notes:** 1) Data Source: Korean Population Censuses in selected years and Projection by Korea National Statistical Office (KNSO)

The age structure of a population can be summarized with the dependency ratio, which is the sum of the child dependency ratio and the aged dependency ratio. The child dependency ratio and
the aged dependency ratio are defined as the proportions of the young (age 15 or below) and the old (age 65 or above) to the total population, respectively. According to Figure 2, the dependency ratio was 47 percent in 1965, declined to 28 percent in 2005, and projected to reach the level of 47 percent in 2050. In 1965, the 43 percent of the population were children, whereas only 3 percent were the old. The share of the young population fell to 19 percent and that of the old increased to 9 percent in 2005. The trend is expected to continue in the future. The proportions of the young and the old population in 2050 are forecasted to be 12 percent and 35 percent, respectively. If the income per person remains the same in the future, the rise in the dependency ratio will directly lead to a smaller amount of tax revenue. This concern is obviously exaggerated if one considers a productivity growth. Therefore, a further research needs to be done to measure the difference between the change in the dependency ratio and the productivity growth. In addition, the existing pay-as-go pension system amplifies the consequence of the population aging. The fundamental problem is that the pension system is exposed to the risk of changing age structure of population, but population policy can be used to mitigate the level of intergenerational inequality. The change of the age structure of the population depends on the changes in fertility, mortality and net migration. Each dimension of the population structure is discussed subsequently.

3 Various Aspects of Fertility Decline

3.1 Marriage Rate and Timing of Marriage

Mechanically speaking, the fertility decline is composed of three aspects of fertility: a delay of age at marriage (or age at first birth), a decrease in the number of lifetime births and an increase in birth intervals. We observe that the fertility is declining in all three dimensions.

The proportion of ever-married of women at age of 30 to 34 was 96 percent in 1985 according
Table 1: Marriage Rate by Cohorts

<table>
<thead>
<tr>
<th>Born in</th>
<th>Age 30-34 in</th>
<th>Ever Married (%)</th>
<th>Currently Married (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1951-1955</td>
<td>1985</td>
<td>96</td>
<td>93</td>
</tr>
<tr>
<td>1956-1960</td>
<td>1990</td>
<td>95</td>
<td>92</td>
</tr>
<tr>
<td>1961-1965</td>
<td>1995</td>
<td>93</td>
<td>91</td>
</tr>
<tr>
<td>1966-1970</td>
<td>2000</td>
<td>89</td>
<td>87</td>
</tr>
<tr>
<td>1971-1975</td>
<td>2005</td>
<td>81</td>
<td>78</td>
</tr>
</tbody>
</table>

Notes: 1) Data Source: Korean Population Censuses in selected years (KOSIS)

to Table 1. For the same age group, the ever-marriage rate decreased to 81 percent in 2005. It is suggested that the decline of the ever-marriage rate took place more rapidly since the middle of the 1990s. The proportion of the women currently married was 93 percent in 1985, and also decreased to 78 percent in 2005. The reasons for having ever married but being currently not married include the death of spouse and divorce. The proportion of women whose spouse had died or who had divorced by the age of 30 to 34 was stable at 2 to 3 percent between 1985 and 2005. Therefore, the declining marriage rate for the age group of 30 to 34 seems to be mainly due to delaying marriage rather than due to an increase in divorce rate.

3.2 Completed Fertility

The number of lifetime births of the married women also declined. As can be seen Table 2, the group of women of age 45 to 49, who are likely to have finished their reproduction period, had 5.6 children on average in 1970. This number is considered as a cohort TFR for the women born between 1921 and 1925. The cohort TFR is understood as the completed fertility, whereas the period TFR captures both the change in the number of births and the timing of childbearing. The average number of children of women aged 45 to 49 decreased to 4.1 in 1985 and to 2.0 in 2005. The cohort TFR may underestimate the number of births for early cohorts due to the maternal mortality. If the women having more children have less chance of surviving beyond the age of 45,
Table 2: Cohort Total Fertility Rate: Number of Children of Married Women

<table>
<thead>
<tr>
<th>Born in</th>
<th>Age 45-49 in</th>
<th>Avg. No. Children at Age 45-49</th>
</tr>
</thead>
<tbody>
<tr>
<td>1921-1925</td>
<td>1970</td>
<td>5.62</td>
</tr>
<tr>
<td>1926-1930</td>
<td>1975</td>
<td>5.23</td>
</tr>
<tr>
<td>1931-1935</td>
<td>1980</td>
<td>4.69</td>
</tr>
<tr>
<td>1936-1940</td>
<td>1985</td>
<td>4.07</td>
</tr>
<tr>
<td>1941-1945</td>
<td>1990</td>
<td>3.43</td>
</tr>
<tr>
<td>1946-1950</td>
<td>1995</td>
<td>2.83</td>
</tr>
<tr>
<td>1951-1955</td>
<td>2000</td>
<td>2.31</td>
</tr>
<tr>
<td>1956-1960</td>
<td>2005</td>
<td>2.00</td>
</tr>
</tbody>
</table>

Notes: 1) Data Source: Korean Population Censuses in selected years (KOSIS)
2) Due to the lack of the fertility section in the 1995 census, the number of children for a cohort born between 1945 and 1950 is taken from the value from the 1990 census. Data show that, for a cohort, the number of children at the age of 40 to 44 is slightly larger than that at the age of 45-49, and the difference decreased over the years.

the cohort TFR is going to underestimate the true mean number of lifetime births.

3.3 Timing of Childbearing

The changes in the age specific fertility rates (ASFR) show that the decline of period TFR is partly due to delaying childbearing. Figure 3.3 displays the number of births per 1000 women for each age group from 1980 to 2005. Three age groups exhibit noticeable trends: the groups of age 20 to 24, 25 to 29 and 30 to 34. The ASFR for all three groups were declining by 1984. Since 1985 has the fertility rate declined monotonically only for the group of age 20 to 24. The ASFR for the group of age 25-29 and age 30 to 34 were stable from 1985 to 1990, and started to increase since 1990. After 1995, the fertility rate for the age group of 25 to 29 started declining, whereas the fertility rate for the group of age 30 to 34 continued to rise. Therefore, the decline of the fertility rate for the women of age 20 to 24 from 1985 to 1990 seems to have been translated into higher incidents of childbearing in the age of 25 to 34. Since 1990, the decline of the fertility rate for the women of age 20 to 29 seems to be associated with an increase in the childbearing at age 30 to 34.
Figure 4: Age Specific Fertility Rate

Notes: 1) Data Source: KOSIS
3.4 Childlessness

The childlessness is low in absolute terms in Korea, but is increasing rapidly since 1990. The proportion of women at age 40 to 44 who have ever married was 99.8 percent in 1970. This marriage rate for the same age group declined to 98.9 percent in 1990 and further down to 96.4 percent in 2005. Most of women in Korea still get married by early 40s, but the marriage rate has been declining sharply since 1990. The ratio of the childless women among those ever-married for the same age group was constant in the range of 1.5 to 1.8 percent for the period 1970 to 1990. The ratio started to increase to 2.8 percent in 2000 and 3.2 percent in 2005. In fact, this proportion of the childless among the ever-married women underestimates the ratio of the childless to all the women. Given that most of women still get married by the age of early 40s, Figure 3.4 at least suggests that the proportion of the childless women is increasing rapidly since 1990.

3.5 Son Preference

Traditionally Koreans have had a strong son preference, but Figure 3.5 indicates the trend in the level of son preference was reversed around 1990. The number of boys per 100 girls at birth increased from 109.5 in 1970 to 116.5 in 1990, which marked one of the highest level in the world. Since 1990, however, the sex ratio declined to the level of 107.7 in 2005. It is remarkable that the decline of the sex ratio took place despite the advance in the medical technology in recent years. The trend towards the balance of gender at birth seems to reflect the equilibrating process in the marriage market. The proportion of the international marriage in Korea was 1.2 percent in 1990, and increased to 13.6 percent in 2005. The couples with a foreign bride accounted for 0.2 percent (out of 1.2 percent total) in 1990, and took 9.9 percent (out of 13.6 percent) in 2005. The explosive increase in the marriage involving foreign bride partly reflects the increase in the value of a woman.

\[\text{The data on the international marriage rate is from KOSIS.}\]
Figure 5: Childlessness

Notes:
1) Data Source: Korean Population Censuses in selected years (KOSIS)
2) The ratio of the childless to the ever-married women in 1995 is missing.
in the marriage market. Also the increasing role of daughters in supporting their parents may explain a part of the trend of gender equity.

**Figure 6: Childlessness**

![Diagram of Childlessness](image)

**Notes:**
1) Data Source: Korean Population Censuses in selected years (KOSIS)

2) The sex ratio indicates the number of male children born per 100 female children.

### 3.6 Theory of Fertility

Economic theories of fertility predict that fertility declines with economic development in a number of ways. Becker and Lewis (1973) propose a framework of quantity-quality of children. If the income elasticity of quality of children exceeds that of quantity, then an increase in income leads to a fewer number of children.
Another reason for the negative relationship between income and fertility is related to the cost of women's time. That is, those households with higher income may face a higher cost of female time either due to higher female wage rates or due to an increase in the value of women's time spent at home. This hypothesis is based on the assumption that child goods are more time-intensive than other consumption goods (Willis 1973).

The availability of modern contraceptives through family planning programs is likely to enable couples to control the number of children and the timing of childbearing better as they desire. With the child mortality rate decreasing, households may not have to hoard more children than they desire for fear of infant deaths or may not need to replace in such cases (Schultz 1997). As the financial market is developed, parents may find various ways of saving for their old age other than investing in their children (Schultz 1997).

The empirical findings for these hypotheses in case of Korea are unfortunately limited. Analyzing the duration models for birth spacing and the count models for the number of children, Kim et al. (2006) find that, in general, husband income has a positive impact on fertility and that women's education and wage tend to lower fertility. However, distinguishing different hypotheses has proven to be difficult, and needs further research.

4 Change in Mortality

The population is aging not only because of the fewer number of births but because of longer lives. Figure 4 indicates that the average length of life has been monotonically increasing in Korea since 1970s. The life expectancy at birth was 62 years in 1970, and increased to 79 years in 2005. The difference in the life expectancy for female and male has been around 7 to 8 years for the same periods. A longer life is considered to be mainly due to a rise in the standard of living and an advance of medical technology. The life expectancy is expected to continue to increase in the future.
as the current trends of economic development and technological advance are expected to continue. For example, the UN Population Division predicts that the life expectancy at birth is 84.4 years in Korea in 2050 (UN Population Division 2005).

Figure 7: Life Expectancy at Birth


5 International Migration

The migration seems to have decreased, if any, the total population in recent years. Figure 5 shows the net international immigration for Koreans and Foreigners in Korea. There can be a few kinds of definitions of migration, and here migration is defined as moving for more than 90
days. The positive net immigration implies that immigration exceeds emigration increasing the total population. The net immigration of Koreans was negative and its volume was in the range of 70,000 to 95,000 for the period 2000 to 2005. The net immigration of foreigners was positive and the volume decreased from 96,000 in 2000 to near zero in 2005. Koreans and foreigners taken together, the immigration exceeded emigration by 13,000 in 2000, but the net immigration decreased since then to the level of -81,000 in 2005. In addition, the magnitude of the net immigration in 2005 is only 0.17 percent of the total population. Therefore, the migration does not seem to be a major force in shaping the age structure of Korean population for now.

![Figure 8: Net International Immigration](image)

**Notes:**
1) Data Source: KOSIS
2) Migration is defined as staying for more than 90 days.
Although the size is still relatively small, the number of foreigners in Korea increased rapidly over the last ten years. A foreigner is required to register when staying in Korea for more than 90 days. As is indicated in Figure 5, the total number of registered foreigners in Korea was 150,000 at the end of 1996, and monotonically increased to 510,000 in 2005. The big jump in the number of the registered foreigners in 2003 was due to a law enforcement that gave legal status to illegal immigrants. The share of the unskilled workers fluctuated between 43 percent and 62 percent, where as the share of the skilled workers decreased from 9 percent in 1996 to 5 percent in 2005. The rate of the increase in the number of registered foreigners over the last 10 years is remarkable, but its size still accounted for only 1.1 percent of the total population in 2005. Nevertheless, it should be noted that the immigration is a potential force for the change in the age structure of a population depending on the immigration policy and the globalization.

6 Forecasting and Its Limitation

According to the gloomy prediction made by KNSO in 2006, the dependency ratio would be 47 percent in 2050. How likely is the projection to be realized? Even though the population forecasting is often the best prediction that can be made based on the existing data, it does not do a good job in fitting the reality. Figure 6 shows the realized TFR and a few projections of TFR made at different points of time. The projection made by Kim (1975) expected the TFR to stay above 2.0 until 1995. The prediction made by KNSO in 1991 was that the TFR would be 1.63 in 2005, and its prediction in 1996 was that the TFR would be 1.71 in 2005. Compared with the TFR of 1.08 in 2005, the difference between the prediction and the realized value seems to be substantial. I do not mean to imply that the population forecasting is of no use, because it is clearly useful for many practical purposes and because those are literally the best guess we have. Nor do I intend to illustrate that the forecasting tend to overestimate fertility rate. The point is that the
Figure 9: Registered Foreigners

Notes: 1) Data Source: Immigration Bureau at Ministry of Justice, Republic of Korea
assumptions made for forecasting do not capture completely the equilibrating process of individuals interacting in the labor markets, the marriage market or the education market, etc. For example, one possibility is that the declining fertility is going to lower the cost of education, in which case people have more incentive to have children than now. This potential response of individuals makes the current forecasting seem to be a little exaggerating the consequences of low fertility. Therefore, it is important to understand the limitations of a set of assumptions imposed for making the population projection, which in turn implies that it is possible to have an impact on the age structure of population through relevant policy tools.

![Figure 10: TFR and Its Projections](image)

**Notes:** 1) Data Source: Korean Population Censuses in selected years (KOSIS), Kim(1975) and the projection by KNSO
7 Externality to Childbearing

The current demographic trend in terms of fertility, mortality and international migration suggests that the aging society is inevitable. If it is a human desire to try to live longer and if the flow of migration is limited, then fertility is left as the only target of population policy designed to affect the age structure of population.

However, the consequences of fertility in themselves do not justify the public intervention because having children is ultimately an individual choice. The intervention is justified when the private interest differs from the social interest in childbearing. The concept of externality is useful in comparing the private and social interests. Externality is the benefit and cost that an individual does not take into account in the decision of childbearing. Then, the relevant policy question becomes whether there exist externalities to childbearing (Lee 1990). The answer to this question involves not only whether government should promote the childbearing but how much it should be willing to pay for the policy.

There can be many sources of the externality. First, there exists an externality in sharing public wealth all people have free access to. These include environmental resources (eg. air, water and silence, etc.), public lands, mineral rights, or fishery, all of which are diminished by sharing. These resources generate negative externality. On the other hand, the burden of public debt is decreased by sharing, which leads to a positive externality.

Second, the public goods provision of goods and services that any number of people can enjoy without congestion of individual satisfaction generates positive externality. These include national defense, weather forecasting, support for research, art, space program Transportation system and public utilities.

Third, the transfer among age groups that takes place through the government generates externality, but net effect depends on the population structure. These include health, education and
Fourth, other government services demanded by members before they reach the age of contributing tax revenues generates negative externality. Lastly, innovation a larger pool of people may generate leads to a positive externality.

Next, a simple evaluation of the externalities to childbearing is conducted for the case of Korea. The calculation in Table 3 is based on evaluating the present value of each source of externality as of 2005 under the demographic projection until 2050 made by KNSO divided by the population size in 2005.

The negative externality due to public wealth including net government debt, public land and stock of fish is estimated to be around 2,000 US dollars, or 13 percent of GDP per person. National defense is estimated to generates 11,000 US dollars of positive externality or 68 percent of GDP per person. The positive externality generated through the provision of health, education and public pension together is valued at 18,000 US dollars, or 113 percent of GDP per person. Other public expenditure on the young children is estimated to lead to a negative externality of 7,000 US dollars. Taking all the components, the net externality to childbearing is estimated to be positive at the value of 20,000 US dollars, or 124 percent of GDP per person in 2005.

This exercise should be interpreted with caution for its limitation. The externalities of the environmental resources and innovation are not taken into account, which are hard to quantify. Also the analysis is sensitive to the assumption on the future technological progress. Nevertheless, it suggests that public goods like national defense and intergenerational transfer are important sources of externality generated by childbearing in Korea.
Table 3: Measuring Externalities to Childbearing in Korea in 2005

<table>
<thead>
<tr>
<th>Item</th>
<th>Externality per capita (US$)</th>
<th>Ratio to GDP per capita</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Public Wealth</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net Government Debt</td>
<td>3,249</td>
<td>0.20</td>
</tr>
<tr>
<td>Government Land and Other Assets</td>
<td>-5,292</td>
<td>-0.33</td>
</tr>
<tr>
<td>Mineral Wealth Rights</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fishery (Coastal)</td>
<td>-24</td>
<td>0.00</td>
</tr>
<tr>
<td>Foreign Aid</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>2. Public Goods</td>
<td></td>
<td></td>
</tr>
<tr>
<td>National Defence</td>
<td>11,020</td>
<td>0.68</td>
</tr>
<tr>
<td>3. Intergenerational</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transfers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health</td>
<td>2,455</td>
<td>0.15</td>
</tr>
<tr>
<td>Education</td>
<td>13732</td>
<td>0.85</td>
</tr>
<tr>
<td>Pension</td>
<td>2,160</td>
<td>0.13</td>
</tr>
<tr>
<td>4. Other Public Expenditure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Externality</td>
<td>19,989</td>
<td>1.24</td>
</tr>
<tr>
<td>GDP per person</td>
<td>16,147</td>
<td></td>
</tr>
</tbody>
</table>

Notes: 1) Data Source: Korean Population Censuses, Population Projection by KNSO, Government Expenditure in 2005
2) The exchange rate applied is 1024.03 (KRW/USD).
3) Mineral wealth right is not evaluated.
8 Concluding Remark

This paper has examined the demographic trend in Korea focusing on the period since 1985. It is suggested that the change in fertility and mortality is the main driving force for the aging structure of population. The continuing decline of fertility below the replacement rate since 1983 is accompanied by the changes in the various aspects of fertility including the delay in marriage and childbearing, an increase in the childlessness and the movement toward the gender equity at birth.

According to the current projection, the aging of population is likely to have substantial consequences including the increasing fiscal burden of working population. This concern is valid as long as the limitation of the forecasting is understood. Further, given that fertility is the major target of population policy, it is argued that the relevant policy question is not whether a government should promote childbearing but how much it should be willing to pay for policy implementation. That is, the public intervention on childbearing should be based on the externalities that it generates.

A simple exercise is conducted in order to evaluate the externalities generated by childbearing in Korea. In Korea, the largest part of the externalities to childbearing seem to be the national defense and the intergenerational transfer. A preliminary evaluation suggests that the externalities to having a child amounts to 124 percent of GDP per person in Korea in 2005. The limitation of the analysis include the sensitivity to the assumptions regarding future technological advance and the difficulty related to evaluating the value of the environmental resources and innovation. Nevertheless, it is suggested that the concept of externality is useful in considering the optimal budget for a set of population programs.
References


