Fertility differentials by level of educational attainment in the context of economic crisis and tempo effects in Korea

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Abstracts

The link between the role of education and fertility decline has been widely studied by demographers and it is found to be negatively related to each other. This paper attempts to shed a new insight on fertility differentials based on the total fertility rates (TFR) of women by education and further explores the role of tempo effects for groups of women defined by the educational attainment levels of women. In addition, the groups with different educational attainment level seem to respond differently in making childbearing decisions when exposed to the economic crisis. Women with lower education seem to take the strategy of postponing childbirths due to economic hardships where they are more affected by the economic crisis (1995-2000) than the groups with higher education level. Tempo adjusted TFR by educational attainment level will be calculated to observe how tempo effects and the impacts of economic crisis influence the TFR of women by educational attainment level.

Keywords: quantum, tempo adjusted fertility, total fertility rate

1. Introduction

The link between the role of education and fertility decline has been widely studied by demographers and it is found to be one of the most constant findings that they are negatively related to each other (Hirschman, 1994). Due to such a strong relationship between education and fertility, many demographers have applied this relationship in diverse areas of demographic research. For example, such a negative relationship between women's education level and fertility has been used in population projection. Lutz & Goujon (2001) developed a multi-state population projection model that considers the educational composition of the population. In another paper, Lutz & Scherbov (2004) considered the effects of changes in educational composition on the fertility as means of reducing uncertainty in their population forecasting model. Jeon (2012) attempted to increase the accuracy of the population projection by taking into account of fertility differentials of Korean women by levels of educational attainment. Kim's (2007) analysis of data from the 2003 Korea National Fertility Survey finds that the changes in the number of births were most prominent those with the least educational attainment level. Kim (2007) concludes that in the wake of Asian Financial Crisis in 1997, the low educated people are most affected by the crisis showing the largest decline in number of births. This paper attempts to shed new insights on fertility differentials based on the TFR of women by education and further explores the role of tempo effects for groups of women defined by different education level. The Korean population census is taken in every 5 years and 4 periods of census data (1995, 2000, 2005, and 2010) and projected population estimates are used to calculate the TFR of Korean women by education level. The main objective of this paper is to focus on the magnitudes of tempo effects on fertility for groups of Korean women defined by different educational attainment levels.

2. Methods

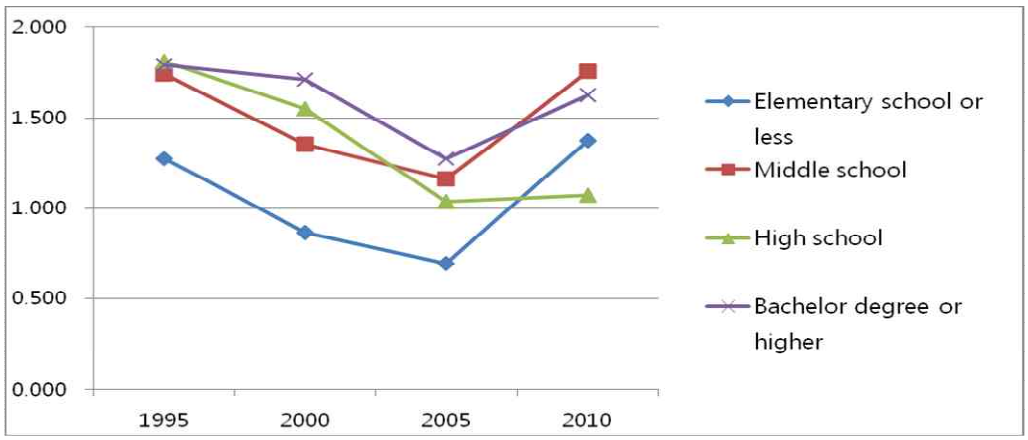
Jeon (2012) used projected population estimates and the census data to calculate the TFR of Korean women by education. Since there are concerns for the presence of omission and redundancy error in the census data, Jeon (2012) used the projected population estimates provided by the Statistics Korea where the total population from

the census is adjusted to correct for the effects of omission and redundancy errors that might arise during the census taking process. Jeon (2012) used the census data to obtain distribution of women by education and age which is then applied to the projected population estimates to obtain the reference population by educational attainment level. Using Jeon's method described above, the TFR of Korean women by education level is reproduced, which is very similar to the results provided by Jeon (2012). In addition, using Ryder's method of tempo adjustment (Ryder, 1964), the tempo adjusted TFR for each group with different education level is calculated.

3. Results

It is still debatable whether economic conditions have negative or positive impacts on fertility. Orsal and Goldstein (2010) suggest that bad economic conditions attributed to fertility decline. On the contrary there are views that harsh economic conditions increase the fertility level since the opportunity cost of having children decrease (Butz and Ward, 1979). The onset of the Asian financial crisis in 1997 prompted the Korean government to implement various stringent economic and policy reforms and these measures significantly affected the daily lives of the Korean people. In Figure 1, the TFRs of all groups defined by education levels show steady declining trends from 1995 to 2005 until they make noticeable recoveries in 2010. Such a decline in TFR depicted in Figure 1 may be attributed to economic woes of the recent decade which supports the idea that fertility behavior of recent decades in Korea has a pro-cyclical relationship with the economic cycle. The decline of TFR in Figure 1 from 1995 to 2005 partially supports the hypothesis that low fertility trend has been exacerbated by the onset of the Asian financial crisis in 1997 and people responded by either reducing the fertility quantum or delaying child birth (tempo effect) which led to the fertility decline.

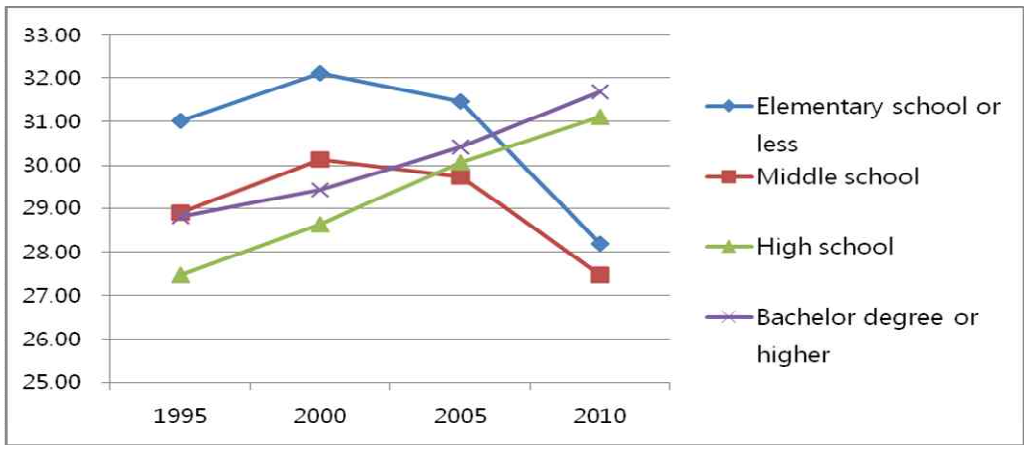
Figure 1: TFR by education level



In Figure 1, the TFR starts to increase in all groups from 2005. The rise in TFR across all groups by educational attainment deserves a further explanation. One possible explanation is the recuperation of delayed childbirths from the 1997 Asian Financial Crisis. By 2005, Korea's economy has made a remarkable recovery from the crisis and economic conditions improved in comparison to the 1997 Asian Financial Crisis. Even during the 2008 global financial crisis, the Korean economy was relatively sound and the economic conditions were much better than they were during the 1997 crisis. In addition, effects of zodiacal preferences on the childbearing behavior in Korea contributed to the rise of the TFR. 2007 was the Year of the Golden Pig where people have beliefs that babies born in the Year of the Golden Pig will live a happy and fortunate life.

It is interesting to note that the increases of TFR in groups with lower education level (elementary and middle school graduates) are steeper than high school graduates and bachelor or higher degree holders. This suggests that fertility behaviors of educational groups do not respond in the same way. In order to determine whether the changes in TFR could be attributed to changing tempo effects, the mean age of mothers at birth by education level is calculated for each group and is shown in Figure 2. There seems to be variations in the magnitudes of tempo effects among groups with different educational attainment levels. The increase in the TFR from 2005 and the possible presence of variations in the magnitudes of tempo effects among the groups require further analysis.

Figure 2: Mean age of mothers at birth



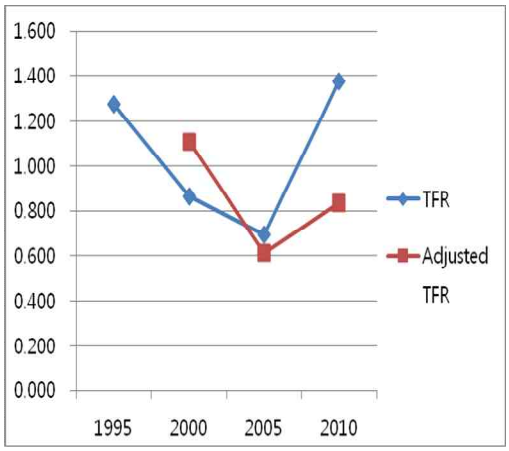
As shown in Figure 2, the mean age of mothers at birth for groups with lower education level (elementary and middle school graduates) are increasing from 1995 to 2000 then decreasing thereafter whereas they are increasing at a steady pace for groups with high school graduates and bachelor or higher degree holders throughout the period. This seems to suggest that women with lower education take the strategy of postponing childbirths due to economic hardships where they are more affected by the economic crisis (1995-2000) than the groups with higher education level. This is also supported in Figure 1 where the TFR of the lowest education level group is hard hit by the economic crisis. As shown in Figure 2, the mean age of the lower educated group starts to decrease from 2000, showing signs of recuperation in fertility level affected by the economic crisis. Using Ryder's method of tempo adjustment (Ryder, 1964), the tempo adjusted TFR for each group with different education level is calculated and shown in Figure 3. The tempo adjusted TFR of lower educated groups show advancement of birth for 2005 and 2010 whereas the tempo adjusted TFR of higher educated groups show persistent postponement of births throughout the period.

The results from Figure 2 and 3 suggest that tempo effects play a role in causing ups and downs of fertility level among the groups differentiated by educational attainment level. In addition, the groups with different educational attainment level seem to respond differently in making childbearing decisions in the midst of the economic crisis. From the perspectives of women's employment trends in Korea, Kim (2012) argues that the premiums of higher education in employment has been dissipating for married women and as of 2010 it no longer exits. Kim (2012) argues highly educated single women are more likely to be employed than less educated women but they are also more likely to drop out of the labor market once they get married. Kim (2012) further argues that the least educated married women's likelihood of getting employed is the highest showing the largest improvement since 1990. This suggests

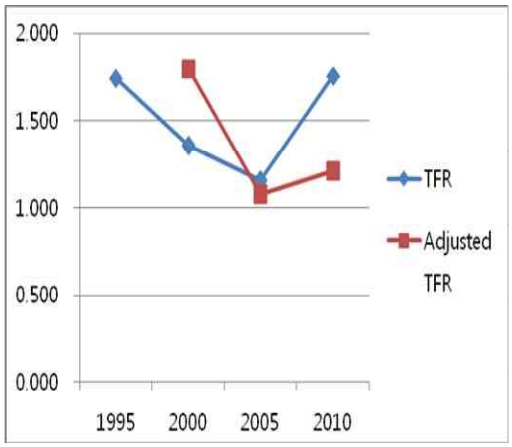
that highly educated women in Korea seem to have difficult times maintaining full time employment and parental responsibilities at the same time when they get married. As for the less educated women (elementary and middle school graduates), the advancement of birth indicated in Figure 3 and the decline in mean age at childbearing suggest that they are more likely to manage the commitments of work and family than their better educated counterparts. Inadvertently the economic crisis dramatically increased the number of part time jobs in the labor market where employers have preferred hiring part time workers to full time workers to minimize labor cost. This could have attracted less educated women into the labor market since majority of the part time jobs require less or no skills with flexible working time. It is possible that the less educated women are more likely to have part time jobs which are often low paid and require low skills and this enable them to cope with work and family commitments. Drago et al. (2002) also observed that full-time employment acts as a significant barrier to childbearing among Australian women when compared to their counterparts in America. However this deserves a further in-depth research for validating a link between employment status and fertility in Korea.

Figure 3: Tempo adjusted TFR by educational level

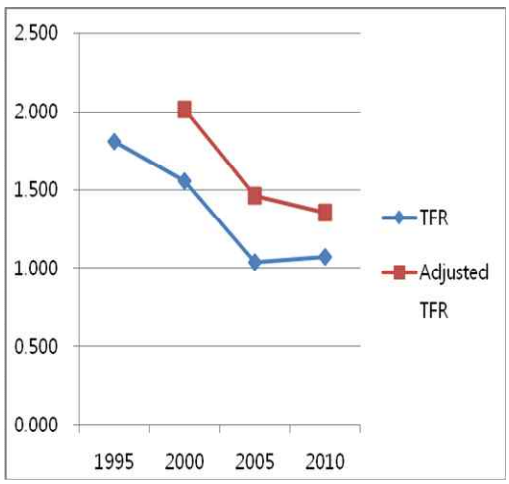
Elementary school graduates



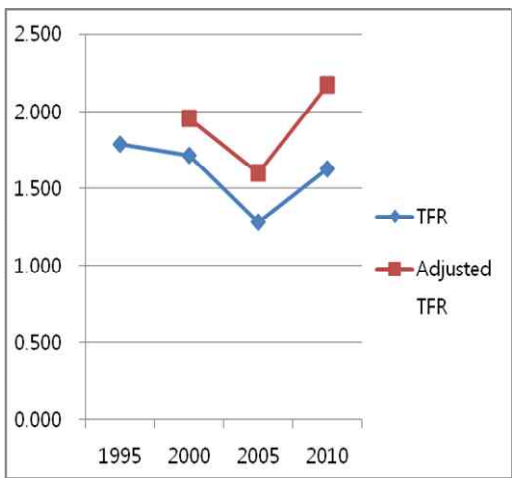
Middle school graduates



High school graduates



Bachelor or higher degree holders



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