

# Transition of Fertility Practice: Measurement Using Demographic Technique of Parity Progression Ratio

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**Abstract** The main purpose of this paper is to investigate causes of lowest-low fertility in South Korea. As for the demographic causes, both delay in marriage and decrease in marital fertility rate had led to the fertility decline but the delay in marriage played a crucial role to press a rebound of the fertility level in recent years. As for the socio-economic causes, the low classes made a significant contribution to further lowering fertility rate in recent years. These findings imply that government's efforts should be made at eliminating barriers for marriage and supporting for lower classes' child rearing.

**Keywords:** lowest low fertility, delay in marriage, marital fertility rate

## 1 Background and Purpose

In South Korea, the low fertility phenomenon below the population replacement level has continued for more than 30 years and the lowest low fertility one below 1.3 has continued for 13 years since 2001. Although the government has launched policies responding to low fertility since 2005, there has been not an optimistic symptom to turn the trends of lowest low fertility. Thus, an attempt to investigate causes of continuation of lowest low fertility becomes very important to overcome the currently on-going demographic crisis. Identifying the mechanism between demographic factors and socio-economic factors which affect on the continuation of lowest low fertility will be an important basis for re-establishing the government's policies to recover the fertility rate. In doing so, we applied the demographic techniques such as demographic decomposition and parity progression ratio (PPR) to the data of vital statistics and the population census.

## 2 Methods and Data

The change in period fertility rate was decomposed by the proportion of the married women to the total and the married fertility rate by the following formula;

$$FR_i = \frac{B_i}{F P_i} = \frac{B_i}{F P_i} \times \frac{MFP_i}{MFP_i} = \frac{B_i}{MFP_i} \times \frac{MFP_i}{F P_i} = MFR_i \times MR_i$$

(FR =period fertility rate, B= number of births in a specific year from females in age i, FP= number of females, MFP=number of married women, MFR=marital fertility rate, MR = proportion of married women to the total, i=age)

A parity progression ratio (PPR) was calculated by the following formula (Henry S. Shryock, Jacob S. Siegel and Associates, 1976);

$$P_{0 \rightarrow 1} = P_1 = \frac{W_1}{W_2}, P_{1 \rightarrow 2} = P_2 = \frac{W_2}{W_3}, P_{2 \rightarrow 3} = P_3 = \frac{W_3}{W_4}, P_{3 \rightarrow 4} = P_4 = \frac{W_4}{W_5}, \dots$$

Those data use for the analyses included statistics from Population and Housing Census, Residential Registration System, and Vital Registration System.

### 3 Main Findings

The total fertility rate (TFR) dropped from 1.78 in 1992 to 1.52 in 1997, and then to 1.08 in 2005. TFR has been below 1.3 since 2001. The demographic decomposition was done to measure the effect of demographic factors such as delay in marriage and marital fertility rate. Both delay in marriage and decrease in marital fertility rate (MFR) had led to the fertility decline between 1992 and 1997, the delay in marriage with a little change in the marital fertility rate played a crucial role to accelerate the decreasing trends of birth rates between 1997 and 2005, and the postponement of marriage still played a role to press a rebound of the birth rate even with an increase in the marital fertility rate during the period between 2005 and 2013.

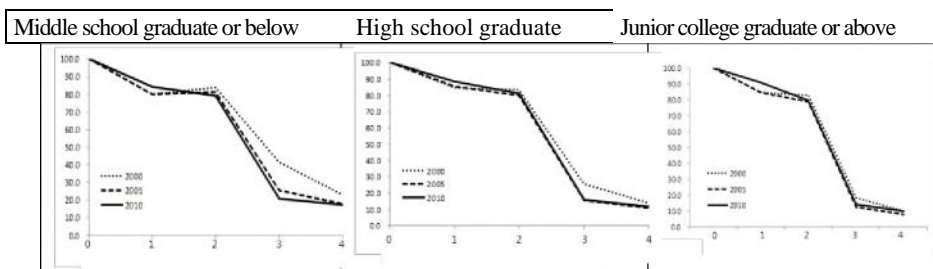
**Table 1.** Results from Demographic Decomposition of Change in TFR

Duration	Change in TFR	Contribution		
		Change by Fertility of Married Women	Change by Marriage Delay	Change by Interaction Effect
1992~1997	-0.24	-0.20	-0.07	0.03
1997~2005	-0.44	-0.52	0.03	0.05
2005~2013	0.11	-0.31	0.54	-0.13
1992~2013	-0.57	-1.10	0.73	-0.20

Source: Calculated using statistics from Population and Housing Census, Residential Registration System, and Vital Registration System.

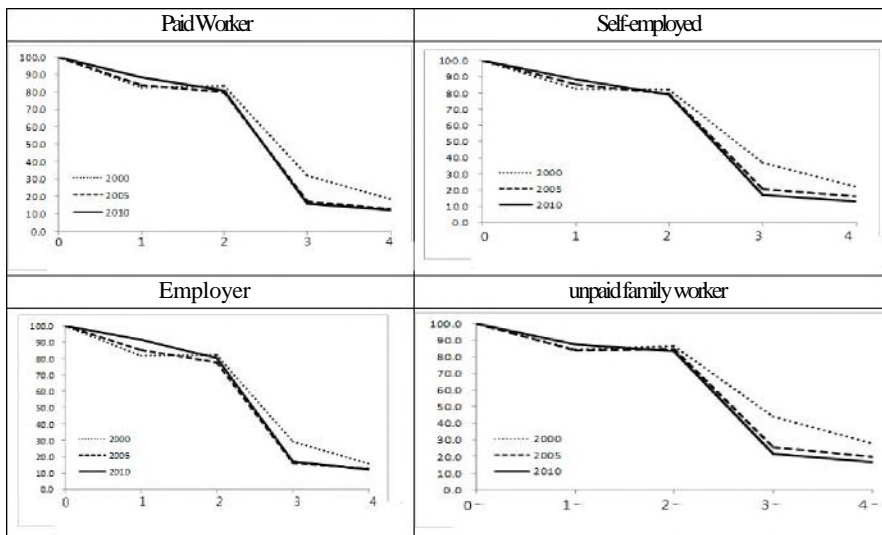
Among Married women aged 45~49, PPRs, specifically for P3→P4, declined between 2000 and 2010. This pattern appeared somewhat differently according to the

socio-economic characteristics. Although PPRs of those women with college graduate or higher were low even in 2000, PPRs of those women graduated from high school declined between 2000 and 2005. The gap in PPRs between 2000 and 2005 or 2010 appeared to rather big for those women with educational level under middle school graduates. By status of work, the biggest drop of PPR for P3—\*P4 appeared for the unpaid family workers, followed by the self-employed, paid workers, and employers. Although the PPR for P3—\*P4 dropped slightly for the professional workers, it was relatively high among skilled agricultural workers, service worker, sales worker and elementary workers.



Source: Calculated using statistics from Population and Housing Census, 2000, 2005, 2010.

Fig. 1. Parity Progression Ratio (PPR) by Educational Level of Married Women Aged between 45 and 49



Source: Calculated using statistics from Population and Housing Census, 2000, 2005, 2010.

Fig. 2. Parity Progression Ratio (PPR) by Status of Work of Married Women Aged between 45 and 49

Managers	Professionals and Related Workers	Clerks
Service Workers	Sales Workers	Skilled Agricultural, Forestry and Fishery Workers
Craft and Related Trades Workers	Equipment, Machine Operating and Assembling Workers	Elementary Workers

Source: Calculated using statistics from Population and Housing Census, 2000, 2005, 2010.

**Fig. 3.** Parity Progression Ratio (PPR) by Occupation of Married Women Aged between 45 and 49

## 4 Conclusions

As for the demographic causes of lowest low fertility, the delay in marriage played more pivotal role in fertility decline than the marital fertility rate in recent years, implying that it is extremely difficult to recover from the lowest low fertility without changing the current marriage behaviors. As for the socio-economic causes, those low classes characteristic of lower education levels, working with unskilled and lower income, etc. who had traditionally high propensity for high fertility rate, made a significant contribution to further lowering fertility in recent years. Thus, Government should make efforts to facilitate the school-to-work, work and life balance, and preparation for housing for the youth. In addition, Government needs some efforts to support for lower classes' child caring and rearing.

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