An analysis of the Lowest Total Fertility Rate in Hong Kong SAR

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Abstract

Total Fertility Rate (TFR) in Hong Kong has decreased significantly in the past 30 years, from 2.48 in 1976 to 0.97 in 2005. Hong Kong has the lowest total fertility rate in the world, 0.97 per woman. It is mainly caused by the increase in number of spinsters which has contributed to about 56% of the decline total fertility rate for the period 1976-2001. Furthermore, the reduction of marital fertility rate has also been shown to be related to another two major causes, namely, delay of marriage and reduction of the family size. A new measure of a weight total fertility rate (WTMFR) is introduced to take into account of the change of age of marriage and the fertility within marriage. The delay of marriage has contributed to about 52% to the reduction of WTMFR whereas the reduction of the fertility within marriage has accounted for the other 48%. Apparently, the proportion of remaining single has been stabilized and leveled off recently. However, the preference of having smaller family size has become a norm rather than an exception. It is very unlikely to see a rebound of fertility among the Hong Kong women in the near future if there is no increase in marriages or births outside wed-lock. Encouraging more births among married women for increasing fertility is expected to have limited impact.

Keywords: *Age at first marriage; decomposition; Hong Kong; Total fertility rate; Weighted Total marital fertility rate*

1 Introduction

The Total Fertility Rate (TFR) which measures the current fertility of Hong Kong has been falling at an unprecedented rate over the past 25 years. It plummeted from the replacement level (i.e. 2.1 births per woman) in 1980 to an all-time low of 0.973 in 2005. It is the lowest by world standards. By comparison, it takes France more than half a century to double the number of older persons (65 years or older); it has only taken Hong Kong only 20 years from 7.4% in 1985 to a 12.1% in 2005 and is expected to rise to 27% by 2033 (C&SD, 2005). Its pace and magnitude of the TFR decline in the past three decade is phenomenal and has serious socio-economical implications.

It is likely that the TFR of 0.973 is distorted by changes in the timing of childbearing (i.e. the tempo effect), as indicated by the mean age of mothers at giving birth continually rising in the past two decades (Bongaarts, 1999; Census and Statistics Department, Hong Kong SAR, 2004). The current TFR trend in Hong Kong is subject to both changes in the timing of childbearing and the number of births. Concurrently, the fertility rate of mothers at important childbearing age (25-34) is falling significantly (i.e. the quantum effect) (Bongaarts and Feeney, 1998). However, the reduction of fertility is somewhat different from other western countries. The tempo effect on fertility caused by the delay of marriage in Hong Kong is expected to be insignificant since the significant reduction of Hong Kong TFR is mainly due to (i) increasing number of spinster; (ii) the delays in marriage (measured by the median age of first marriage) and (iii) reduction of childbearing within marriage (measured by the total marital fertility rate (TMFR)).

However, there is no quantitative linkage available to directly measure the impact of delay in marriage and childbearing on the TFR. The aim of this paper is to employ a decomposition technique to split the change in the TFR in Hong Kong into two components: (i) change in proportion of now married females; and (ii) change in marital fertility rate, so as to arrive at a clearer picture on how the change in the TFR has evolved. Furthermore, a new measure, a Weighted Total Married Fertility Rate (WTMFR) is introduced to reflect fertility schedule among married women in the population taking into account of the age of marriage. Using a decomposition method we can quantify what attributable to the change of WTMFR. We discuss the interpretation of the measure and its relationship to the reduction of TFR.

2. Definitions

The paper uses birth data for the period 1981-2005 which is made available from the

Census and Statistics Department of the Hong Kong SAR. We need some definitions and notations.

Fertility rate – The rate represents the number of births occurring in a year per woman in a given community. The fertility rate is age-specific (AFR) if its denominator contains women in a particular age group, and age-marital-specific (AMFR) if its denominator contains only married women in a particular age group. The age specific fertility rate (AFR) is the number of live births occurring to women in a given age group during a calendar year to the total female population at mid-year in that age group. The AFR for females of age group i in year t is AFR_i^t :

The total fertility rate (TFR) – The rate can be understood as expressing how many children could be expected by a woman living through the whole of their reproductive lives (from 15 to 49), provided that, at different ages, they reproduced themselves at the rates experienced in a given year. For convenience, the TFR can be expressed as the number of children born per woman. A TFR of 2.1 is equivalent to the replacement rate of 1, which means that on average *one woman* in a given community would produce an average of *one girl* (to replace her mother) throughout her reproductive life. This is the replacement level of fertility because it is from its women that a community replaces itself.

The total marital fertility rate (TMFR) – The rate can be understood as expressing how many children could be expected by a woman marrying at certain age (say 20 as in Yip and Lee, 2002) living through the whole reproductive period, provided that, at different ages, they reproduced themselves at the rates experienced in a given year. For convenience, the TMFR can be expressed as the number of children born per married woman marrying at certain age. However, *marriage rate* for women in different age groups are different in the community, the TMFR only can represent the fertility for those group who get married at that particular age. It is important to take into account of the shift of median marriage age of women and aspiration to have babies within marriage which has experienced drastic changes in Hong Kong. For example, the median age of marriage for women has increased from 23 in the 80's to 28 in 2005. (FPHAK, 2005; C& SD, 2005).

3. Methodology and Notations

3.1 A Kaplan-Meier Curve to estimate the proportion of women who would remain

single in the life time.

Women are divided into each five-year age group, from 15-54 (marriage period) and 15-49 (reproductive period). A female in a certain age-group i would choose either marry or remain single. We define the marital rate, q_i, given by

$$q_i = M_i / N_i$$

where M_i is the number of newly married females in the mid-year in age group i, N_i is the number never married women in the mid-year in age group i. Since it's a five-year group, we obtain the probability of remaining never married for the five year period is given by $(1-q_i)^5$. The probability to remain as a spinster after age 54 is $S_k = \prod_{i=1}^{k} (1-q_i)^5$, $i = 1,\ldots,k$, $k = 1,...,7$, where S_k is the usual Kaplan-Meier estimator. (Andersen et al., 1993)

3.2 A weighted total married fertility rate (WTMFR) to detect the changed marital fertility rate

In order to provide a more comprehensive measure to describe the fertility among the marital women, we introduce a weighted total married fertility rate (WTMFR) to show effect of the change of age structure of marriage on $TMFR_i$ which denotes the number of children expected by a woman married in age group i. Here the WTMFR is a weighted average of the $TMFR_i$ and the weight w_i, is the proportion, i.e

$$w_i = m_i / m$$

where m_i is the number of women get married in age group *i* in a certain year and *m* is the number of now married women in this year. However, the information was not available in the population, we approximate it by the number of first marriage in the age group *i*, i.e.

$$\tilde{w}_i = f_i / f$$

where f_i is the number of women of age group *i* first married in a certain year, *f* is the number of all first married women in the same year. The information is readily available from the data base of the marriage registry (C&SD, 2005). Then we can obtain WTMFR:

$$WTMFR = \sum_{i=1}^{7} TMFR_i \times \tilde{w}_i .$$

Yip & Lee (2002) have defined TMFR as children expected by a woman married in 20. However, less than 3% women get married at the age of 20 and the median marriage age for women is 28 in 2005 for Hong Kong. Also, the TMFR is sensitive to the sudden increase in fertility among the young group (FPAHK, 2005) and the WTMFR gives a more robust estimate for the fertility among the married women. Also,

a decomposition method is used to quantify the effect on the fertility among married women due to shift of marriage age and marital fertility rate.

3.3 A decomposition method for detecting the reasons for change of TFR and WTMFR

The following notations are used in this method:

B_i^t = Births born to females aged *i* in year *t*;

K_i^t = Females aged *i* in the middle of year *t*;

k_i^t = number of married females aged *i* in the middle of year *t*;

N_i^t = Now married females aged *i* in the middle of year *t*.

Moreover, a bar over a variable (i.e. $\bar{a}$) denotes the average of the variable over two time-points and a delta in front of a variable (i.e. $\Delta a = a^{t_1} - a^{t_0}$) denotes the change of the variable over two time-points t_0 and t_1. Since female foreign domestic helpers would unlikely give births in Hong Kong, there were more than 200,000 women belonging to the age group 20-49 which have been excluded in our calculation (C&SD, 2005).

The total fertility rate in year *t* is TFR^t :

$$TFR^t = \sum_i AFR_i^t \quad \text{where} \quad AFR_i^t = \frac{B_i^t}{K_i^t}$$

The age specific marital fertility rate (*AMFR*) for now married females aged *x* in year *t* is $AMFR_i^t$:

$$AMFR_i^t = \frac{B_i^t}{k_i^t}$$

Let p_i^t be the proportion of now married females aged *x* in the middle of year *t* among all females aged *x* in the middle of year *t*:

$$p_i^t = \frac{k_i^t}{K_i^t}$$

3.3.1 A Decomposition for TFR

Let ΔTFR be the change in the total fertility rate between two time-points t_0 and t_1. ΔTFR can be decomposed into two components in the following way:

$$\begin{aligned}
\Delta TFR &= \sum_i \left[AFR_i^{t_1} - AFR_i^{t_0} \right] \\
&= \sum_i \left[\frac{B_i^{t_1}}{K_i^{t_1}} - \frac{B_i^{t_0}}{K_i^{t_0}} \right] \\
&= \sum_i \left[\frac{B_i^{t_1}}{k_i^{t_1}} \times \frac{k_i^{t_1}}{K_i^{t_1}} - \frac{B_i^{t_0}}{k_i^{t_0}} \times \frac{k_i^{t_0}}{K_i^{t_0}} \right] \\
&= \sum_i \left[\frac{1}{2}\left(\frac{B_i^{t_1}}{k_i^{t_1}} + \frac{B_i^{t_0}}{k_i^{t_0}} \right) \times \left(\frac{k_i^{t_1}}{K_i^{t_1}} - \frac{k_i^{t_0}}{K_i^{t_0}} \right) + \frac{1}{2}\left(\frac{k_i^{t_1}}{K_i^{t_1}} + \frac{k_i^{t_0}}{K_i^{t_0}} \right) \times \left(\frac{B_i^{t_1}}{k_i^{t_1}} - \frac{B_i^{t_0}}{k_i^{t_0}} \right) \right] \\
&= \sum_i \left[\overline{AMFR_i} \times \Delta p_i + \overline{p_i} \times \Delta AMFR_i \right]
\end{aligned}$$

From this formula, it can be seen that the change in the TFR may be decomposed into two components : one from compositional changes in age specific proportions of now married females (Δp_i) and one from changes in age specific marital fertility rates ($\Delta AMFR_i$), weighted respectively by the average age specific marital fertility rates ($AMFR_i$) and the average age specific proportions of females married (p_i) over two time-points.

3.3.2 A decomposition for WTMFR

To assess the impact of marital structure change on WTMFR explicitly, we use a decomposition technique to split the change of WTMFR into two components: Let $\Delta WTMFR$ be the change in the Weighted Total Marital Fertility Rate between two time-points t_0 and t_1 and it can be decomposed into two components as follows for a totally 7 age groups, i=1,…,7:

$$\begin{aligned}
\Delta WTMFR &= \sum_i \left[w_i^{t_1} TMFR_i^{t_1} - w_i^{t_0} TMFR_i^{t_0} \right] \\
&= \sum_i \left[\frac{1}{2}\left(w_i^{t_1} + w_i^{t_0} \right) \times \left(TMFR_i^{t_1} - TMFR_i^{t_0} \right) \right. \\
&\quad \left. + \frac{1}{2}\left(TMFR_i^{t_1} + TMFR_i^{t_0} \right) \times \left(w_i^{t_1} - w_i^{t_0} \right) \right] \\
&= \sum_i \left[\overline{TMFR_i} \times \Delta w_i + \overline{w_i} \times \Delta TMFR_i \right]
\end{aligned}$$

Notes: Δw_i is the change in w_i

$\Delta TMFR_i$ is the change in $TMFR_i$

$\overline{w_i}$ is the average of w_i of two time-points

$\overline{TMFR_i}$ is the average of $TMFR_i$ of two time-points

4. Results

Kaplan-Meier Curve

Figure 1:

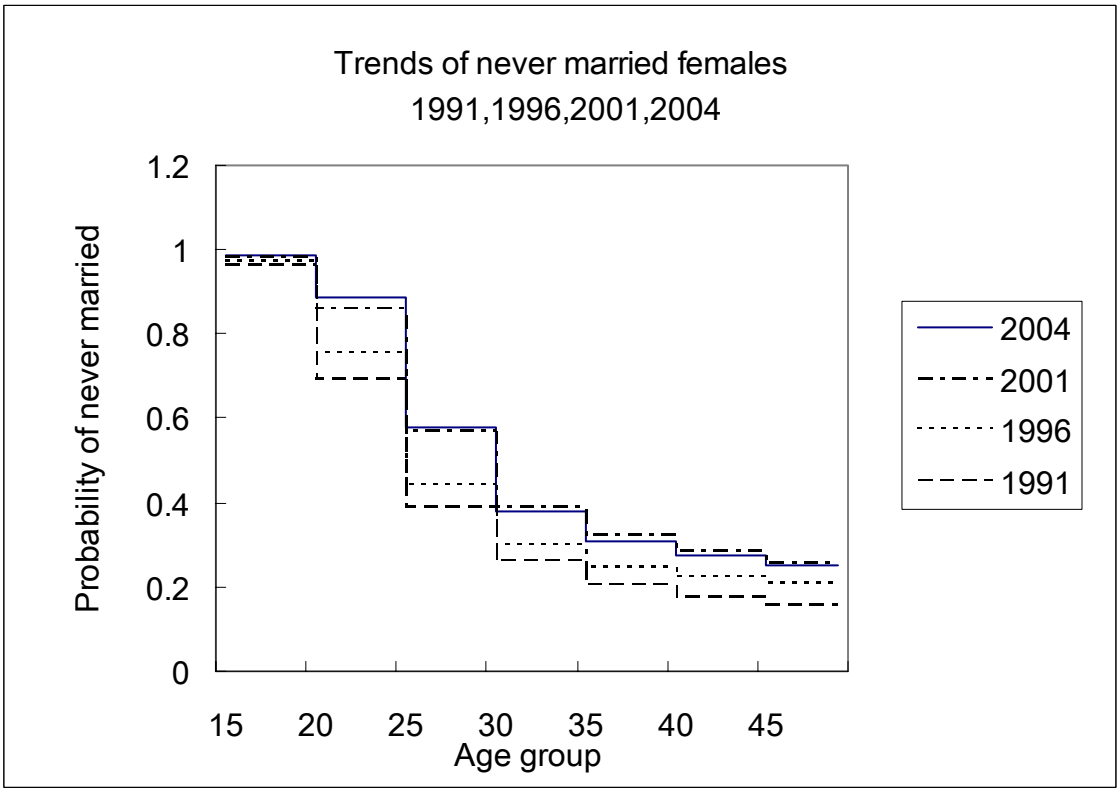


Figure 1 gives the survival curves of women who remain single in different age groups for the years 1991, 1996, 2001 and 2004. Teens marriage is not that common, for the age group 15-19, the four 5 year intervals' data on proportion of never married is almost the same, between 0.96 and 0.99. In age group 20-24, only about 70 percent females remain single in 1991 while in 2001, up to 80 percent females still remain single! Proportion of getting married after age 25 increases, however, the proportion of remaining single increased throughout the 15 years period. For example, in the age group 40-44, only 17 percent females remain single in 1991, while there are still 20 percent females remains single in 1996 and 25 percent in 2001. The proportion of remaining never married has experienced a monotonic increasing across all age groups as seemed in Figure 1. Meanwhile, The problem became more and more serious, the

gap of age group 25-29between 1996 and 2001 is about two times of the gap between 1991 and 1996. For the curve of year 2001 and 2004, we can see that from age 25, the curve of 2001 is a little above the one of 2004. This may due to that women who delay their marriages have not got married in 2001, and then get married in 2004 while they may have already entered the followed age group. For example, a woman ought to get married in 2001 in her 23, but she delay it to 2004, and at that time she is 26, belonging to age group 25-29. This case may happen commonly; hence the curve of 2004 from age 25 may go down a little. Overall, we can see a clear trend of marriage delay. This also has been certified by the fact that, median age of marriage (female) has gone up from 23.4 years old in 1976 to 28 years old in 2003.

WTMFR

Figure 2 shows the age-specific total fertility rate from 1976 to 2001. Age specific marital fertility rates discount the effect of marriage from the overall fertility. By making use of the information on marital status collected in population censuses and by-censuses, the age specific marital fertility rates can be computed. AMFR decreased with increasing ages and the highest rate was at ages 15–19. This is associated with the propensity of marriage as a result of premarital pregnancy.

Figure 2:

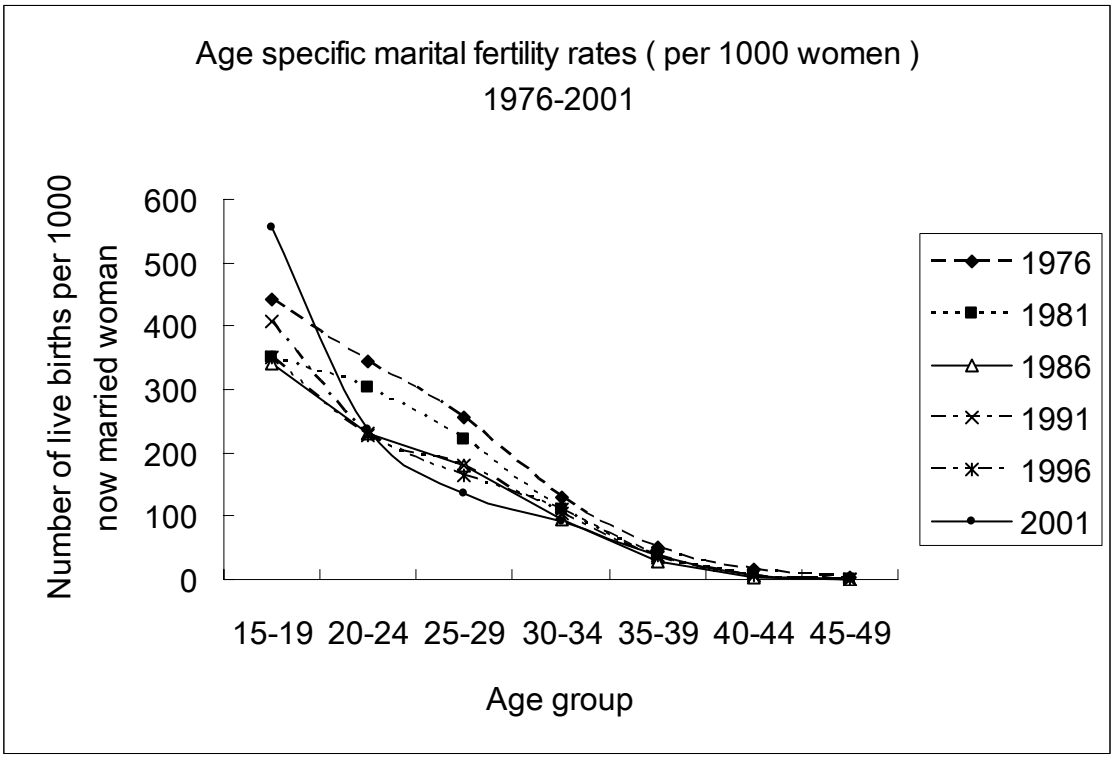


Table 1: TMFR, WTMFR and TFR of each year

	Total Marital Fertility Rate(per woman)					
Age group	1976	1981	1986	1991	1996	2001

15-19	6.175	5.14	4.41	4.815	4.485	5.345
20-24	3.965	3.395	2.7	2.78	2.73	2.56
25-29	2.25	1.885	1.545	1.625	1.59	1.37
30-34	0.97	0.775	0.64	0.72	0.775	0.685
35-39	0.33	0.22	0.17	0.2	0.225	0.22
40-44	0.075	0.035	0.02	0.025	0.03	0.03
45-49 *	*	*	*	*	*	
WTMFR	3.65	2.92	2.04	1.97	1.79	1.58
TFR	2.48	1.933	1.367	1.281	1.191	0.932
TMFR($TMFR_{20}$)	6.175	5.14	4.41	4.815	4.485	5.345

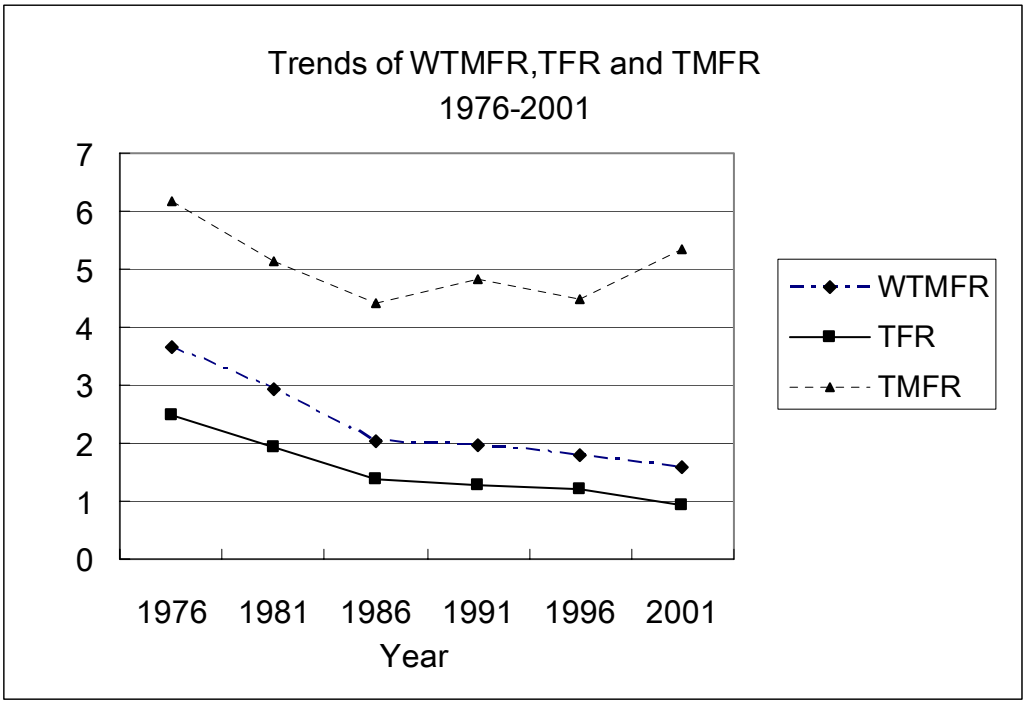
*: very few data < 0.005

Table 1 gives the TMFR, WTMR and TFR for comparison. Except age group 15-19, the TMFR has consistently reduced in all age groups. For this, we all know that pregancy in age group 15-19 is really hard to predict. Though there is an increase in TMFR for the age group 15-19 due to possibly increasing teens pregnancy, the effect on the WTMFR is minimum since its relative weight is small. The most significant reduction of TMFR happened at the age groups 20-24 and 25-29. It reduced from nearly 4 children to 2.56 for the age group 20-24 and 2.25 to 1.37 for the age group 25-29. Apparently, as the median age of marriage increases, for those who got married after age 30, the expected number of children was only 0.685. Figure 2 shows that age-specific martial fertility rates has reduced consistently throughout the 25 years especially for the age groups 20-24, 25-29 and 30-34, which are the three main productive periods for women with much higher weight in comparing to other age groups. In age group 25-29 in 2001, it even reduced for 0.2 live births per woman than 1976.

The WTMFR base in Section 3.2 has reduced from 3.65 in 1976 to 1.58 in 2001. The reduction was about 57% for the 25 years period whereas the TFR had reduced from 2.48 to 0.9 for the same period.

Figure 3 gives the plots of TFR, TMFR ($TMFR_{20}$) and WTMFR for the period 1976-2001. The TFR and WTMFR are almost the same shape, while the trend of TMFR is not the same as trend of TFR. This shows the new measure WTMFR is more robust in describing the marital fertility in the population. Apparently, the marriage delay is the main reason for the TFR decline.

Figure 3:



Decomposition

Table 2 shows that over the period from 1976 to 2001, changes in proportion of now married females accounted for 56% of the decline in the TFR from 2.48 to 0.932, while changes in age specific marital fertility rates accounted for 44% of the decline in the TFR. When analysed by age, changes in proportion of now married females aged 20–29 accounted for nearly 40% of the decline in the TFR. With higher education and increasing employment opportunity, females play a more important role in society and become more independent. Many females have delayed their marriage or even remain single. Moreover, the increasing number of Hong Kong men married to women from the mainland of China also reduced Hong Kong women's choice of potential marriage partners. Comparatively, changes in marital fertility rates for females aged 20–29 only accounted for 29% of the decline in the TFR. A major portion of this was due to the drop in marital fertility rates for females aged 25–29.

Further analysis had been carried out by splitting the study period into three parts: 1976 to 1986, 1986 to 1996 and 1996 to 2001. The TFR decreased by 1.113 from 2.480 in 1976 to 1.367 in 1986. The decline had then slowed down, with a mild decline of 0.176 to 1.191 in 1996, and then a decline of 0.259 to 0.932 in 2001. During 1976 to 1986, the decline in the TFR was most rapid. This was mainly caused by the decline in marital fertility rates for females in their twenties and early thirties that accounted for half of the decline in the TFR. The decline in the proportion of now married females aged 20–29 accounted for another quarter of the decline in the TFR.

During 1986 to 1996, rises in marital fertility rates led to an increase in the TFR. However, such an increase was offset by drop in proportion of now married females. There were increases in marital fertility rates for females aged 30–39, possibly due to a catch-up effect following the delay in marriage at their twenties. The drop in proportion of now married females aged 20–34 led to substantial decline in the TFR, which was equivalent to 114% of the actual change in the TFR.

During 1996 to 2001, the catch-up effect for females in their thirties had ceased. On the other hand, the marital fertility rates for females aged 15–24 had increased, partly due to the increasing number of births born in Hong Kong to young females from the mainland of China. However, the decrease in marital fertility rates for females aged 25–34 offset all the contributions arising from increases in marital fertility rates for young females. During the period, the contribution from change in the proportion of now married females (62%) was even more significant to the decline in the TFR.

Table 2
Decomposition of the change in the total fertility rate, 1976–2001#

	Proportion (%) of decline in the TFR attributable to change in		
Age group	Proportion of now married females	Age-specific marital fertility rate	Total
15–19	5	-1	4
20–24	18	7	25
25–29	20	22	43
30–34	9	9	18
35–39	3	3	6
40–44	*	3	3
45–49	*	*	*
Total	56	44	100

Notes: #During this period, TFR fell by 1.548, from 2.480 to 0.932.

*Less than 0.5.

A positive figure indicates that the factor led to a decrease in the TFR whereas a negative figure indicates that the factor led to an increase in the TFR.

As an illustration, the calculation of the proportion of decline in the TFR attributable to the change in the proportion of now married females aged 25–29 (20%) during 1976–2001 (using the formula above is as follows :

$[5 \times \overline{AMFR_{25-29}} \times \Delta p_{25-29}] / \Delta TFR$

$= [5 \times (0.256 + 0.137) / 2 \times (74\% - 42\%)] / (2.480 - 0.932)$

$= 20\%$ (calculations are carried out using unrounded figures)

Table 3: Decomposition of change in WTMFR

Proportion (%) of decline in the WTMFR attributable to change in w_i and $TMFR_i$ 1976-2001			
Age group	w_i	$TMFR_i$	Total
15-19	27.89	3.40	31.30
20-24	45.89	27.22	73.11
25-29	-14.40	15.57	1.17
30-34	-6.73	1.64	-5.09
35-39	-0.68	0.19	-0.48
40-44	0.03	0.02	0.05
Total	51.95	48.05	100

w_i: proportion of women who get married in age group i among whole now married women.

A positive figure indicates that the factor led to a decrease in the TFR whereas a negative figure indicates that the factor led to an increase in the TFR

Table 3 shows the decomposition result for WTMFR. Over the whole period from 1976 to 2001, changes in w_i accounted for 52% of the decline in the WTMFR from 3.65 to 1.58, while changes in total marital fertility rates accounted for 48%. When analyzed by age, changes in w_i and $TMFR_i$ of 20-24 had accounted for over 70% of the decline in WTMFR. In age group 25-29, change of w_i contributes 14% to increase WTMFR. For example, comparing with 1976, in 2001 there are more people intend to marry in 25-29 instead of 20-24, so the increasing proportion of marriages in 25-29 increases a little WTMFR. The similar results happen to age group 30-34 and 35-39. However, the slight negative effect observed for the age groups 30-34 and 35-39 has little effect on the WTMFR.

In decomposition of TFR and WTMFR, we have two different weights. The first one p_i stands for the proportion of now married women in the whole population (based on age group i). Hence contribution to change of TFR made by change of p_i describes the effect of marriage numbers change, in other words, increasing number of

spinster. The second one w_i stands for the proportion of women get married in age group i among the whole now married women. Hence contribution to change of WTMFR made by change of w_i describes the effect of the shift in marriage age, in other words, change in marriage structure.

5 Discussion

The total fertility rate (TFR) plummets from the replacement level (i.e. 2.1 children per woman) to 0.8, which is the lowest in the world after excluding the births from non-Hong Kong residents (Yip and Lee, 2002). No other places ever experience such steep declines in the TFR. Even the very low fertility countries normally take a fairly long time to get the TFR falling to particular low levels below replacement, and the fertility rates tend to stabilize at such levels. Examples of these countries include Spain (1.1), Italy (1.2), Germany (1.3), Sweden (1.4) and Japan (1.5). The TFR in most of the countries still remains at a level ranging from 1.5 to 1.8 (World Health Organization, 2004). The TFR falls continually and shows no sign of recovery in Hong Kong.

We have shown that significant reduction of fertility in Hong Kong were related to (i) increasing number of spinster; (ii) the delays in marriage (measured by the median age of first marriage) and (iii) reduction of childbearing within marriage (measured by the total marital fertility rate (WTMFR). The increase in the number of spinsters, the delay in marriage and the reduction of family size among the married couples has increased considerably in the past three decades which has a significant effect on the total fertility rate of Hong Kong. One of the reasons is due to significant improvement in women education level of women. Proportion of women remaining in tertiary education has been increasing due to the expansion of the education opportunities and there are more female undergraduates in the tertiary education system (Hong Kong Government, 2005) Also, women working participating rate has continuously improved and has increased from 30% to more than 50% in 2003 (Census and Statistics Department, 2005). More women are financially independent and getting marriage is not really high on the priority list.

Furthermore, there were an increase in the number of marriages between Hong Kong men and Mainland women. In 2004 one third of the registered marriages (approx 12,000) is Hong Kong men with Mainland China women whereas Hong Kong women and Mainland China men accounted for two thousands only. It leads to further imbalance of supply and demand of never married male and females in the community. It is estimated that the never married group of women aged 20-49 has outnumbered the number of men of aged 25-54 by more than 80,000 (Yip et al., 2005). It certainly creates additional barriers for Hong Kong women to get married. Furthermore, there was only 8

percent of births who were outside wedlock in comparing to the nearly 30-60% in western countries (Prioux, 2005).

The delay of marriage has also imposed additional barrier for fertility. Due to the difficulties of conceiving births at older age, it is difficult if no possible to fulfill the aspiration of having more children even if they want to have after getting married. Based on the KAP survey by Family Planning Association of Hong Kong, about 25% of women had not achieved their desired number of children (FPAHK, 2005). On the other hand, it is true that the desire of having less children within marriage is the norm rather than the exception in the last three decades.

As shown by the decomposition of the WTMFR, raising the fertility among married women is not that easy, there are structural deep-rooted problems in the community about having more children (Yip et al., 2005). Apparently, getting them to marry and earlier would have more significant impact in raising the fertility level. Also, it is easier to promote the fertility among married couples from no children to one or from one to two. The effort of encouraging them to increase the number of children from two to three is expected to be high and the effect on the overall fertility would be minimal. We shall expect that the downward trend will not reverse in the near future and most likely to be leveling off. It implies the very low TFR likely to remain below 1 for some time. The fertility rate will neither go back to 1 in the short and medium term nor rise above 1 in the longer term unless there is a significant fertility rebound, or a substantial increase in the number of births out of wedlock, or a consistent rise in the proportion married. Judging by the past reproductive behaviors and marriage habits, these prerequisite conditions will be most unlikely to occur.

The demographic scene in Hong Kong has altered dramatically during 1976-2005. Fertility falls sharply and the marital structure undergoes major changes with many women of marriageable age remaining unmarried. If the tendency for late marriage and low aspiration to have children persist, the demographic consequence would eventually be insufficient replenishment of the labor force. Furthermore, long-lasting below-replacement fertility will inevitably result in continued ageing of the labor force. A slow-growing and ageing labor force has far-reaching implications for the economic vitality of Hong Kong.

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