Measuring the contribution of each reproductive age women for the difference in mean age at last birth and mean age at first birth: A Methodological Innovation in Fertility Research

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Extended Abstract

Description of the topic to be studied:

Recently a number of attempts have been made by several researchers to derive childbearing indices such as mean age at first birth, mean age at last birth and mean reproductive life span from the simple information on age specific fertility rates. (See Horne et al. 1990, El-khorazaty and Horne, 1992, Sivamurthy, 1987; and Murthy, 1992). Attempts were also made to derive the Bongaarts proximate determinants indirectly from the indirectly derived childbearing indices. However, no one tried to find the contribution of each age to the difference in mean age at last birth and mean age at first birth. The mean reproductive life span, which is generally considered to be of 35 years starting from 15 years of women to the age of 49 or 50 years, is observed reduced with the progress in the fertility transition of any country. In countries like Japan where the fertility transition is almost completed you may find the reproductive life span of women to be around 4 years in the year 2001.The mean age at first birth of Japan in the year 2001 is observed to be around 28 years, the mean age at last birth is observed to be 31 years. Contrary to Japan, in developing countries like India you may find the reproductive life span to be more than 10 years or so. For instance, India's mean age at first birth in the year 1996-200 is observed to be around 23 years and mean age at last birth is observed to be 33 years. Thus the Mean reproductive life span (MRLS) in the year 1996-200 is observed to be about 10 years. An understanding of the reproductive life span is of great use in the policy point of view. India consists of several populous states and each state is at a different level of fertility transition. While the states in the north of India are still at the starting stage of the fertility transition with high TFR and MRLS levels, the states in

South of India with a lowest level of fertility of less than 2.1 or so (like Kerala state) are at the end of the fertility transition. So one may find a lot of variation in the fertility transition-taking place in different states of India itself. And thus it is of interest to know how much each reproductive age of women contributing for the declining mean reproductive life span of women over the transition periods.

Objectives:

In the present paper an attempt has been made (i) to suggest a methodology to estimate the childbearing indices of mean age at first birth, mean age at last birth from the life table approach, which is traditionally used in mortality analysis; (ii) to suggest a methodology to decompose the contribution of each reproductive age of women for the difference between the mean age at last birth and the mean age at first birth.; (iii) to illustrate the above two methodologies using the data of Japan and India overtime; (iv) to study the fertility transition of the major states in India using the child bearing indices and the decomposition results thus obtained.

Data:

The only data used in this study is the single year age specific fertility rates. The required data on ASFRs for Japan, India and its major states has been collected from relevant published sources such as the Population Statistics of Japan 2003 and the Sample Registration System, various issues, of the Registrar General of India.

Methodology:

The child bearing Indices of mean age at last birth and mean age at first birth have been derived using the traditional life table approach. For decomposition of the difference between the mean age at last birth and mean age at first birth we have used the United Nations decomposition method traditionally used for decomposing the life expectancy at birth of males and females.

Both the life table approach and the decomposition methods are simple to apply and easy to understand. The only input data needed is a schedule of age-specific fertility rates preferably in single year for the country under consideration. In case the ASFRs are given in 5 year age groups they may be converted into single year ASFRs using simple linear interpolation formulas such as the one suggested by Sivamurthy (1987).

Results:

The methodology has been illustrated using Japan and India as examples. For illustrative purpose we used the single year age specific fertility rates of Japan for the years 1930 to 2001. We have also used the single year age specific fertility rates for India for the years 1970-75 to 1996-200. In case of India five year ASFRs have been converted into single year ASFRs using a simple interpolation method that has been suggested by Sivamurthy (1987). The results of the analysis are very encouraging. The four charts give below

clearly indicates the usefulness of the decomposition method for the study of childbearing process in developed as well as developing countries.

[Full text and results of the paper for states in India will be presented in the full paper]

Chart 1 and Chart 3 illustrate the transition in the childbearing indices as well as TFR in case of Japan and India over time. From these charts you may find that MRLS has been declined continuously over the transition period both in case of Japan as well as India.

Chart 2 and Chart 4 illustrate the age specific contribution of women to the difference between Mean age at last birth and Mean at first birth, that is, for the observed MRLS value for any year under consideration.

The adding up of the contribution by each reproductive age of women will give the mean age of the reproductive life span for that year. For instance the mean reproductive life span of 3.55 observed for Japan in the year 2001 is seen in Chart 2 as distributed in absolute terms as the contribution made by each reproductive age women over from 15 to 49 years. We may observe that the maximum contribution for the MRLS of 3.55 has come here from the ages 23, 24, 25, 26 and 27 unlike the only age 22 for the year 1930. Comparison of the 1930 curve with that of 2001 curve in case of Japan, for instance, clearly indicate that MRLS has been declined over the transition period from 1930 to 2001 and also the contribution of each age for the MRLS has also been reduced from more than 1 point in the year 1930 to less than 0.4 point in the year 2001 in case of all the reproductive ages of women. The curves also show that the peak has moved from a single age to a set of 3 ages in the year 2001. Thus the figures are clearly indicating the difference in the childbearing process and thus the fertility transition-taking place in Japan. Similar is the case with India. However the fertility transition process is observed to be different from Japan when compared to India, and thus the fertility curves clearly gives us an opportunity to compare the Japan's situation with that of India to that matter even to the different states in India at a glance.

Thus the two methodologies suggested here seems to be of immense use and are important in the study of fertility transitions of different countries in the world.
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Chart 1: Trends in Total fertility rate, Mean age at first birth, Mean age at last birth, and Mean reproductive life span: Japan: 1930 to 2001

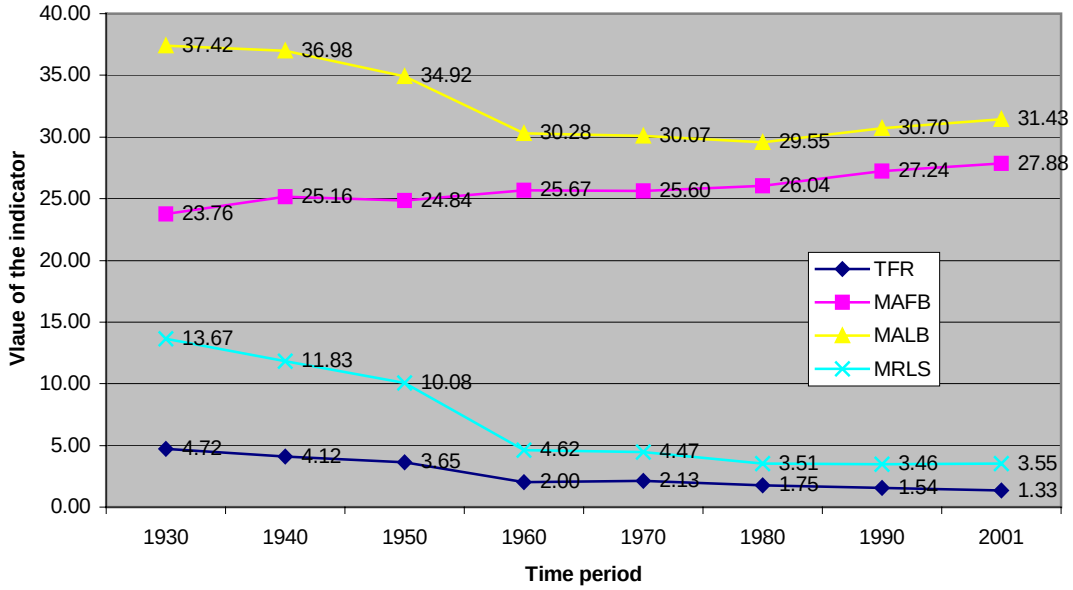

Chart2: Absolute contribution of each reproductive age women for the difference in mean age at last birth and mean age at first birth: Japan: 1930 to 2001

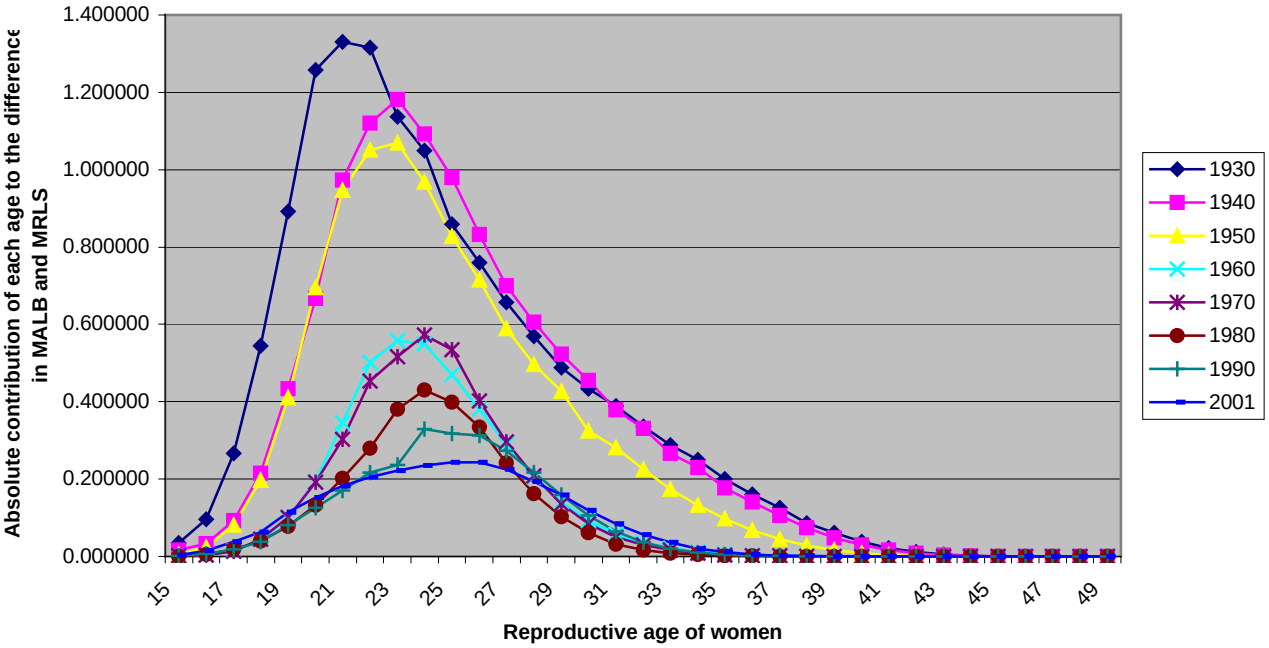

Chart 3: Trends in Total fertility rate, Mean age at first birth, Mean age at last birth, and Mean reproductive life span: India: 197-75 to 1996-2000

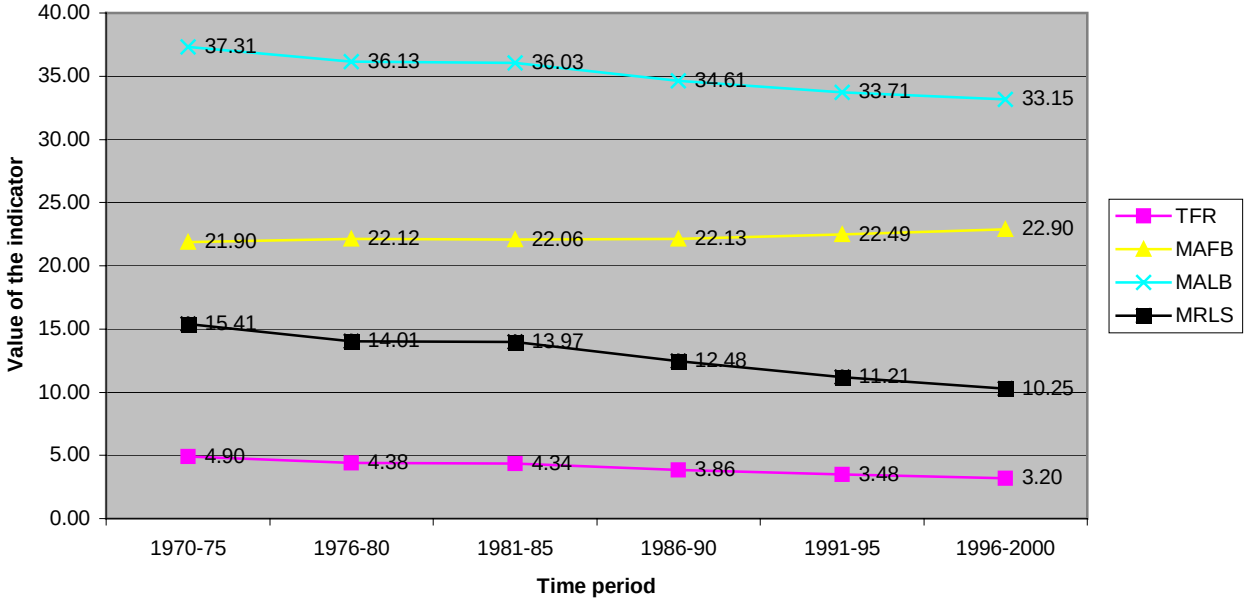

Chart 4: Absolute contribution of each reproductive age women for the difference in mean age at last birth and mean age at first birth: India: 1970-75 to 1996-2000