

# On the Quantum and Tempo of Fertility

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**ESTIMATES OF FERTILITY** are among the most widely used demographic statistics. In many developing countries recent levels and trends in fertility are avidly watched by policymakers, family planning program managers, and demographers to determine whether and how rapidly fertility is moving in the desired downward direction. In much of the developed world, where fertility is now at historic lows, these same statistics are examined for signs of an upturn in fertility back to the replacement level needed to prevent future declines in population size. Given this interest in measuring human reproduction, it is desirable for users of fertility statistics to understand the strengths and weaknesses of available indicators. It is particularly important to avoid basing policies on statistics that give potentially misleading information.

Although the demographic literature offers many measures of fertility, the total fertility rate (TFR) is now used more often than any other indicator. The TFR is defined as the average number of births a woman would have if she were to live through her reproductive years (ages 15—49) and bear children at each age at the rates observed in a particular year or period. It is a hypothetical measure because no real group of women has experienced or will necessarily experience these particular rates. The actual childbearing of cohorts of women is given by the completed fertility rate (CFR), which measures the average number of births 50-year-old women had during their past reproductive years. The CFR measures the true reproductive experience of a group of women, but it has the disadvantage of representing past experience: women currently aged 50 did most of their childbearing two to three decades ago when they were in their 20s and 30s. The advantage of the TFR is that it measures current fertility and therefore gives up-to-date information on levels and trends in fertility. Another reason for the popularity of the TFR is its ease of interpretation compared with some other measures. Most interested persons will have little difficulty interpreting fertility measures expressed in births per woman, but few non-demographers will know intuitively whether populations with a crude birth rate of 10 (births per 1000 population) or a general fertility rate of 100 (births per 1000 women of reproductive age) have high or low fertility.

The simplicity and wide availability of the TFR have contributed to a neglect of some deficiencies in this fertility indicator. The demographic literature on the measurement of fertility includes many criticisms of and alternatives to the conventional TFR, but there is no agreement on a replacement for it. In the next section we provide a brief selective review of the past half-century of demographic literature on the subject. This is followed by a proposal for arriving at an adjusted version of the TFR that is free of so-called tempo effects—distortions due to changes in the timing of births. The conventional TFR can be considered to consist of a quantum and a tempo component. We define the quantum component as the TFR that would have been observed in the absence of changes in the timing of childbearing during the period in which the TFR is measured. The tempo component equals the distortion that occurs due to timing changes. Our objective is to measure the quantum component by eliminating the tempo distortion from the conventional TFR. The resulting quantum measure will be called the tempo-adjusted TFR.

**(Excerpt)**

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