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5.2.1. Tempo and quantum effects

Postponement of maternity is one of the determinants of the decrease in total fertility rates in Europe. Based on earlier studies, Bongaarts and Feeney (1998) explain how total fertility rates can be divided into the quantum effect and tempo effect. The quantum effect is the total fertility rate that we would have observed, had there been no change in the timing of births. The tempo effect is the effect of changes in timing. To decompose fertility into the quantum and tempo effects, birth-order specific birth rates are needed for each one-year period and single year of age of the mother. The tempo-adjusted birth-order specific total fertility rate in that year, $(adj)TFR_i$, then can be computed as:

$$(adj) TFR_i = TFR_i / (1 - r_i),$$

where TFR_i is the observed birth-order specific total fertility rate, r_i is the increase in the mean age of the mother at the birth of the i -th child. For example, if the mean age at first births increases from 27.0 to 27.1, $r_1 = 0.1$. In order to obtain a measure of tempo and quantum effects, the adjusted total fertility rates should be computed by birth order ($i = 1, 2, \dots$) and be summarised over birth orders:

$$(adj)TFR = \sum_i (adj)TFR_i$$

The difference between the observed total fertility rate (TFR) and the adjusted total fertility rate $(adj) TFR$ is then a measure of the tempo effect.

The decomposition of total fertility rates into the quantum and tempo effect has been studied for a number of countries (Kohler, Billari and Ortega, 2002; Lesthaeghe and Willems, 2002; Kohler and Philipov, 2002). The main result from these studies is that postponement is responsible for some of the decrease in fertility, but that there are also substantial quantum effects. As pointed out by Kohler, Billari and Ortega (2002), it is a well-established result that there is a connection between