

## Paradigm Shift in Demography?

### Editorial to the Special Issue “Tempo Effects in Demographic Period Indicators”

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Demography mainly defines itself – in contrast to other disciplines of the social sciences – through the indicators resulting from its range of methods, like the “number of children per woman”, “divorces per marriage” or “average life expectancy”. Derived from the period perspective these indicators are the basis of many studies in the social sciences and also for projecting future trends. Until today, theoretical approaches are rare in demography. Consequently, demography is still a mainly quantitative discipline, however one with important interdisciplinary character since on the one hand all areas of the social sciences are dependent on demographic indicators and on the other hand demography itself uses the theories and hypotheses of its neighbouring disciplines. In recent years, however, the basic and since many decades well established concept of demographic period estimation has been questioned.

Shortly before and after the turn of the millennium the demographers John Bongaarts and Griffith Feeney published two papers in which they showed that age-specific period rates – which are the basis of the most commonly used period indicators for fertility (total fertility rate) and mortality (life expectancy) – not only include the relative quantum of the demographic events but also so-called “tempo effects” (Bongaarts/Feeney 1998, 2002). These effects appear whenever the average age at which the analyzed event occurs changes during the period of observation. Since in most applications demographic indicators are supposed to reflect the currently realized fertility or experienced mortality, according to the authors tempo effects have to be seen as undesired distortions. Therefore, Bongaarts and Feeney suggested to adjust demographic period indicators for tempo effects.<sup>1</sup> With this

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<sup>1</sup> In the German version of this issue we translate the terms “tempo adjustment” and “tempo-adjusted indicators” by “Tempo-Bereinigung” and “tempobereinigte Indikatoren”. This is contradictory to my first German publications on tempo effects where I used the term “tempo-standardisiert” (Luy 2009a, 2009b, 2011). After discussing this issue with several German speaking colleagues I came to the conclusion that the German term “Bereinigung” fits Bongaarts’ and Feeney’s idea better than “Standardisierung”.

proposal Bongaarts and Feeney strive for a paradigm shift in demographic analysis. The question is: will this change actually take place?

The publications of Bongaarts and Feeney caused an intensive discussion among demographers which resulted in many workshops and special sessions at the most important international conferences. The papers presented at these events and the corresponding publications were dominated by opponents of the tempo approach. However, this should not be surprising and cannot be used as reason for its rejection since such developments are typical for scientific innovations and can be observed in several examples in the history of science. Nevertheless, I was also convinced by the arguments of the “tempo opponents” for several years. This changed, however, when I had to prepare a lecture on “special methods in demography” at the University of Rostock in 2005, in which I intended to demonstrate the unreasonable concept of tempo adjustment to the students. While modelling some examples for representing the relationships I realized that the tempo approach is not unreasonable at all and that the arguments of the tempo opponents are – according to myself – to some extent based on misunderstandings of Bongaarts’ and Feeney’s approach.

Although many methodological issues concerning tempo adjustment are still unsolved and require further intensive research I am by now convinced of the tempo approach. Consequently, I apply it in my empirical studies whenever possible or I consider at least the possibility that tempo effects influence the level of as well as differentials in conventional period indicators. I expect that similar changes in the thinking of the entire demographic community will occur and that tempo-adjusted measures will become established as key or at least additional period indicators in the future. However, tempo-adjusted indicators are still far from being a demographic standard. But there is increasing evidence that the development proceeds in this direction. Especially in fertility research tempo adjustment is spreading increasingly. The discussion on the analysis of mortality, however, is still dominated by the tempo opponents, although a rethinking among demographers seems to begin here as well. The dispute among demographers is not irrelevant: it has been shown for the analysis of both fertility and mortality that tempo adjustment can lead to very different conclusions compared to the use of conventional indicators (see e.g. the analysis of fertility conditions in Europe by *Goldstein et al.* 2009 or of mortality differences between Western and Eastern Germany by *Luy* 2006).

Until today the discourse took more or less exclusively place in the English literature. Therefore, I am very grateful to the editors of *Comparative Population Studies—Zeitschrift für Bevölkerungswissenschaft* for offering me the opportunity to coordinate a special issue on that topic. The bilingual publication of this journal makes it possible to introduce the tempo approach to the German demographic literature. Moreover, the papers of this special issue should also provide very important contributions and new thought-provoking impulses to the international discussion.

The first paper “Tempo Effects and their Relevance in Demographic Analysis” by myself provides a general overview of the basic ideas of Bongaarts and Feeney and the previous discussion on the tempo approach (*Luy* 2010). It is the product of different lectures and several talks which I gave in recent years on this subject.

The main aim of the paper is to answer typically arising questions such as “what do tempo-adjusted indicators measure?” or “why and for what purpose should I use them?”. Another aim is to dissolve a further confusing aspect of the tempo approach. With regard to tempo effects in fertility and mortality it is often argued that both processes are fundamentally different, and therefore the idea of tempo adjustment could not be simply transferred from one demographic process to the other: every human must die, but some women do not only postpone giving birth, but they do not get any (further) children at all. For the tempo approach, however, it is not of significance when the postponed events occur. Likewise it does not matter whether the considered indicator reflects demographic quantum (e.g. the total fertility rate) or tempo (e.g. life expectancy). I hope that this article (together with the other papers of this issue) help(s) to clarify such questions and allow(s) more demographers and scholars from related subjects to get a better understanding of the tempo approach.

The second paper “Mortality Tempo: A Guide for the Skeptic” by Griffith Feeney develops a discrete approach to describing and analyzing distortions in indicators for period mortality caused by tempo effects (Feeney 2010). The main aim of this article is to illustrate the idea of Bongaarts and Feeney with regard to the analysis of mortality – which is for many scholars more difficult to follow. Christian Wegner’s paper “Tempo Effects in Different Calculation Types of Period Death Rates” builds on the thoughts of Griffith Feeney and shows that tempo effects emerge in each of the three different variants to calculate age-specific death rates as the basis of period life tables (Wegner 2010). So far, the existence of tempo effects in mortality has been only demonstrated and discussed regarding one way of calculation, and thus this paper provides an important extension of the respective methodological discussion. The main innovation of this paper, however, is the differentiation between two types of tempo effects which have different impacts on the three calculation variants of the death rate.

The two last papers deal with tempo effects and demographic indicators regarding fertility. First, Marc Luy and Olga Pötzsch present estimates of the tempo-adjusted total fertility rate in Western and Eastern Germany from 1955 to 2008 (Luy/Pötzsch 2010). With this paper the authors fill a gap in demographic research on fertility in Germany since a description of trends in the tempo-adjusted TFR did not exist so far. This is a consequence of the fact that the necessary data was not available in official German population statistics until recently. This changed with the supplement of the Population Statistics Act in 2007, making it possible to calculate the tempo-adjusted TFR for Germany with official population data from 2009 on. To estimate the tempo-adjusted TFR for the second half of the 20<sup>th</sup> and the first years of the 21<sup>st</sup> century Luy and Pötzsch used several alternative data sources from which the necessary information was derived. In the fifth paper entitled “Misleading Policy Messages derived from the Period TFR: Should we stop using it?” Tomáš Sobotka and Wolfgang Lutz discuss several politically relevant questions and come to the conclusion that the conventional TFR is inappropriate for practical application since it frequently leads to incorrect interpretations of period fertility levels and trends (Sobotka/Lutz 2010). This can result in distorted policy conclusions and, potentially,

in misguided policies. The authors present the tempo-adjusted TFR as a meaningful alternative indicator.

Altogether this collection of papers provides a broad overview of the idea, the methodological implementation and the practical implications of Bongaarts' and Feeney's tempo approach. Empirical examples help to demonstrate the specific aspects in a comprehensible manner. This is an important extension of the previous discussion of tempo effects which lacks practically relevant questions in large parts. Insiders probably realize that the authors of this special issue are predominantly affiliated to the Vienna Institute of Demography of the Austrian Academy of Sciences (VID). This is due to the fact that during the last years, tempo effects became one of the main research topics of the VID, and thus many demographers who work on that subject are associated with this institute. The discussions and seminars held at the VID resulted not only in support, further development and empirical application of tempo-adjustment but also in alternative methodological approaches (e.g. *Ediev* 2011). As a consequence it must be admitted that this special issue mainly reflects the points of view of supporters of the tempo approach. Thus, although all papers went through the standard peer-review process, it cannot be ruled out that they contain some kind of "pro-tempo-bias". Therefore, however, this collection of papers constitutes a fair counterpart of the previous publications which – as already mentioned – were dominated by tempo-opponents (see e.g. *van Imhoff* 2001 and *Schoen* 2004 with regard to fertility and the collection of papers in *Barbi et al.* 2008 with regard to mortality analysis).

For each of the articles in this special issue it is important to keep in mind that tempo adjustment exclusively concerns period indicators and is by no means related to the estimation of cohort levels and trends. The differentiation between period and cohort perspective is more difficult than it might seem at first glance. Mixing up these two perspectives and the wrong assumption that Bongaarts and Feeney introduced tempo adjustment to estimate cohort conditions are the most common sources for misunderstandings and confusions regarding the tempo approach. With the hope that this remark guides readers to understand the basic idea of Bongaarts and Feeney better, I wish everyone interested in developments in demography a stimulating reading.

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