Distributionally adjusted life expectancy

Erratum

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In response to the points raised by M. Muszyńska and J. Silber I would like to suggest that it should be clear from my paper that the proposed measures are not new in the literature. In particular, the paper by Hicks (1997) uses the Gini index to adjust for life expectancy at birth to incorporate the inequality dimension in the Human Development Index. In the same vein, the papers by Foster, Lopez-Calva and Szekely (2005) and Kovacevic (2010) use the Atkinson index to make similar adjustments. Also, the paper by Ghislandi, Sanderson and Scherbov (2019) proposes using the geometric mean instead of the arithmetic mean in the length of life distribution as a way of incorporating distributional aspects in measuring the length of life. These papers, among many others, are quoted in section 3.

Having said that, and after reading the papers by J. Silber, I realize that he makes very similar points to me, but many years earlier. Unfortunately, I was not aware of these publications, which should certainly be mentioned in the literature review. The purpose of this *Erratum Letter* is to fill these gaps. A similar point can be made about the empirical application of Muszyńska and Jansen (2016).

The "*equal equivalent length of life*" terminology that I use, p. 378, and that J. Silber used before, was coined in the path-breaking paper of Atkinson (1970), which is quoted in all references. I use it precisely in the connection of the first family of indices in my paper with Atkinson's (1970) work on income distribution, where he develops the concept of "*equal equivalent income*". Atkinson's (1970) ideas can be applied to any variable for which a distribution makes sense, at least in the context of a social welfare approach, so "equal equivalent income, wealth, length of life, years of schooling, unemployment duration,…" is common terminology in this research area.

Distributional matters in economics can be studied from a social welfare approach, directly following Atkinson's work (1970), or from an axiomatic approach. Both methodologies usually arrive at the same type of indices, but they follow different routes. Silber's work follows Atkinson (1970) and the social welfare approach, whereas my starting point is the axiomatic approach following Shorrocks's (2009a) work on unemployment duration and starting from a mean: life expectancy.[1] I felt that the social welfare approach is less intuitive in the context of the life tables since, as I point out in the paper, "*some key assumptions commonly employed in [the inequality] literature do not have a direct transposition to the health context. While reducing inequality in the income distribution is possible, without altering the mean, through a transfer of income from the rich to the poor… a reduction of inequality in the length of life distribution cannot be achieved by this mechanism. We simply cannot reduce longevity of older people to increase the length of life of younger people.*" (p. 371)

[1] Shorrocks (2009a, 2009b) offers an example in which the same type of indices are derived from different perspectives, the axiomatic approach, Shorrocks (2009a), and the welfare approach, Shorrocks (2009b). Following different routes he arrives at the same point in both cases.

Hence my contribution to the literature lies in providing an axiomatic approach to derive a life expectancy index that incorporates distributional considerations, starting from a sample mean and generalizing this to power means (p. 375). Imposing sensible axioms on this we eventually arrive at the social welfare function of Atkinson (1970) in a life table context, as pointed out by Silber (1983), but I follow a different route based on Shorrocks's (2009a) work on unemployment duration.

There are other minor contributions that I do not emphasize too much in the paper (section 4.2, p. 378). For example, the connection between the Gini index and the generalized Lorenz curve of Shorrocks (1983), which shows that this index cannot be written in mean form, or the consideration of a life index measure that is decomposable by population subgroups (p. 380), and that is related to the entropy indices of inequality (Shorrocks 1980, 1984), but that it is not homogeneous in the length of life, and hence has less appeal in this context since it cannot be written as proportional to life expectancy.

References

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