

15th Meeting of the Ottawa Group

10 – 12 May 2017

Session 7: Multilateral index methods

A comparison of price index methods for scanner data

Antonio Chessa, Statistics Netherlands
Johan Verburg, Statistics Netherlands
Leon Willenborg, Statistics Netherlands

Scanner data offer new opportunities and challenges for price index calculation compared to traditional price collection, for instance in the use of transaction data for constructing product weights within elementary aggregates. This raises the question how Jevons indices, which are still used for supermarket scanner data, compare with more sophisticated methods. This paper compares weighted and unweighted bilateral and multilateral methods on department store scanner data of different product groups. The results show that: (1) applying equal weights to products within elementary aggregates may lead to considerable differences compared to weighted methods, (2) bilateral methods either do not capture the full population dynamics expressed by scanner data or may suffer from chain drift, and (3) differences among multilateral methods are smaller but cannot be ignored. Differences between hedonic and other multilateral methods can be ascribed to the lack of interaction terms between item attributes in traditional hedonic models. Inclusion of pairwise interactions improves model fits and gives results that are practically the same as for the Geary-Khamis (GK) and time product dummy (TPD) method. We show that the GEKS has a number of issues. One of these is a downward bias in cases with dump prices for disappearing products; GK and TPD indices are insensitive to such prices. Differences between window updating methods for including information from a new month are rather small in this study, but the use of rolling windows combined with splice methods has shown signs of drift. Methods that calculate direct indices with the most recently updated set of parameter values are free of chain drift. An extensive follow-up study is being prepared for further analyses and to verify the findings with scanner data of different retailers. More attention will then be given to the problem of product definition and the impact of different degrees of product differentiation on price indices.