DEPARTAMENTO DE ESTATÍSTICA,
ANÁLISE MATEMÁTICA E OPTIMIZACIÓN

A. Saavedra-Nieves
E-mail: alejandro.saavedra@usc.es
Department of Statistics, Mathematical Analysis and Optimization
University of Santiago de Compostela, Spain

Michael Kane
Editor-in-Chief of The R Journal
E-mail: michael.kane@yale.edu
Yale University, USA

Dear Editor-in-Chief,

Thank you for your e-mail of March 14, 2021, including the referee's report on our paper "IndexNumber: An R Package for measuring the evolution of magnitudes" (coauthored by P. Saavedra-Nieves).

Attached herewith please a revised version of our manuscript following the referee's comments and suggestions. A detailed point by point reply to the report is given in the following pages. All proposed changes have been incorporated or discussed in the revision.

Finally, we would like to take this opportunity to thank again the referee for his/her help with this paper and also with the R package.

Yours faithfully.

Best regards.

A. Saavedra-Nieves.

REFEREE RESPONSE
IndexNumber: An R Package for measuring the evolution of magnitudes

Authors: A. Saavedra-Nieves and P. Saavedra-Nieves

We would like to thank the referee for the helpful comments provided. We have followed the recommendations, modifying the original version of the paper, taking into account the suggestions in the report.

Next, we reply to the referee comments point by point.

Referee's question: *On page 1 we can read: "Between 1864 and 1880, Laspeyres (1864, 1871), Drobisch (1871) and Paasche (1874) worked on the evolution of prices for material goods. All of them are non-weighted calculation methods.". It is not true, i.e. all these indices are weighted formulas. For instance, the Lapeyres formula is the weighted arithmetic mean of price relatives. It should be corrected.*

Our answer: The referee is completely right. It is a mistake that has been modified in the new version of the manuscript. Specifically, we have written: "Between 1864 and 1880, Laspeyres (1864, 1871), Drobisch (1871) and Paasche (1874) worked on the evolution of prices for material goods from the approach of weighted index numbers.".

Referee's question: *The sentence from page 2: "Białek (2012) proposed a general formula for Fisher, Laspeyres and Paasche index numbers." should be rewritten as follows: "Białek (2012) proposed a general price index formula with the Fisher, Laspeyres and Paasche indices as its particular cases." (or something similar, because this general formula is much broader than the set with above-mentioned three indices).*

Our answer: Again, the referee is right. Following his/her advice, this sentence was replaced by "Białek (2012) proposed a general price index formula with the Fisher, Laspeyres and Paasche indices as its particular cases.".

Referee's question: *On page 8 we have: "The Bradstreet-Dûtot index at time t, BDt (X), is introduced in Walsh (1901).". But I cannot see any differences comparing it to the "classical" Dutot (1738) price index.*

Our answer: The difference between the Bradstreet-Dûtot and Dûtot indexes as time t can be observed from the denominators of Equations (6) and (9) in the manuscript. The denominator of the Bradstreet-Dûtot index refers to the magnitude in the base period ($\sum_{i=1}^{n} x_{i0}$). However, the denominator for the Dûtot index is written in terms of the magnitude in time $t-1$ ($\sum_{i=1}^{n} x_{i\ t-1}$, $t = 1, \cdots, T$).

Therefore, these indexes deal with comparisons of magnitudes in time t with respect to, in principle, two times that can be totally different. In fact, Dûtot index, whose formula is more general, is equal to the Bradstreet-Dûtot index only for the case $t = 1$.

Referee's question: *On page 11 we can read: "Of course, there exist other libraries in R dealing with index numbers theory. In particular, micEconIndex and IndexNumR packages also allow to compute complex index numbers but only when the considered magnitudes are prices and quantities". Currently, the PriceIndices package is also available on CRAN.*

Our answer: According to the referee's indication, we have cited the R package `PriceIndices` as an available library on CRAN in the revised version of the manuscript. Specifically, on page 11, we have replaced the existing sentence on packages for index numbers by the next one: "In particular, `micEconIndex`, `IndexNumR` and `PriceIndices` packages also allow to compute complex index numbers [...].".

Referee's question: *There is still something wrong in attached file "Saavedra.R" - for instance I got: "Error in ind.index[i,] <- x[i,] * y[1,]" or "Please, introduce a matrix with the prices of different products".*

Our answer: After several executions of the script *Saavedra.R*, the error that the referee reports does not appear. We recommend that referee checks that he/she is using the last version of the library. In other case, he/she should update it. Regardless, we attached again the script *Saavedra.R* that we have used in case it could be of any help.

Referee's question: *When we calculate price indices we get figures with the OY axis titled "Price" (page 17 or 19). I think that "Price index" or "Index number" (similarly to Table from page 16) would be more accurate.*

Our answer: Following the referee's recommendation, we have updated the R package `IndexNumber` including this change. Concretely, *"Name of the magnitude variable: Index number"* is now the y-axis label of the generated figures. We have dismissesed the label *"Price index"* because, as we mention in the manuscript, the library `IndexNumber` was designed in order to consider general magnitudes different, for example, from prices and quantities. Moreover, the consideration of the name of the variable in the graphical representation is due to we believe that it is also important to include some reference on the analyzed magnitude. Finally, we remark that figures in the revised version of the manuscript were updated conveniently.

Referee's question: *I would use a term "chain indices" (commonly accepted terminology) instead of "index number in chain".*

Our answer: According to the referee's advice, we have included the term *chain indices* to refer to index numbers in chain in several pages of the manuscript. However, we have also decided to maintain the expression *index number in chain* because it is consistent and it has certain parallelism with the term *index number in serie*. For instance, we have written the next sentence on page 4 (where index numbers in chain are introduced): "Thus, the value of the *index number in chain* or simply the *chain index* (cf. Forsyth and Fowler, 1981) [...]".

We would like to thank you again your useful suggestions that have improved the manuscript and also the R library `IndexNumber`.

A. Saavedra-Nieves and P. Saavedra-Nieves.