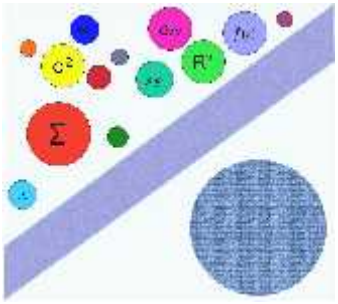

CONFERENCE "DEALING WITH COMPLEXITY IN SOCIETY: FROM PLURALITY OF DATA TO SYNTHETIC INDICATORS"

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ABSTRACT

COMIC: A tool for composite indices evaluation

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Background: As well know, there is a wide variety of software that creates synthetic indicators applying methods that the developers consider the most suitable. Unfortunately, a lot of software has a poor reporting feature and is simply an implementation of one or few methods with no investigation about the robustness of the synthetic indicators created. COMIC is a software

developed by the authors as members of the Italian Institute of Statistics (Istat) Scientific Commission for measuring the "Equitable and Sustainable Well-being" (BES) in Italy.

Objectives: In order to ease the BES Commission in the evaluation of a well-being synthetic indicator, the software proposed in this paper compares different methods and investigates their robustness by performing the influence analisys. One of the main purposes is to deliver results readily fruible and shareble among the researchers.

Methods: Some different aggregation methods have been implemented, more precisely, six static methods and four dynamic ones to take into account for time changes of the phenomena considered (Massoli et al. 2013a, 2013b). In order to choose the most suitable method, the user can compare more than one method at the same time. Input data files layout is easy to understand and requires a little user's effort. Data relevant to different periods of time can be appended. Even though the software proposed is optimized to deal with italian groups of regions, it can also deal with every type of statistical units. The optimization is the creation of geographical maps coloured with the composite indices values. Basically, COMIC is designed to perform composite indices evaluation with their own ranks. For each period of time in the data a report is generated. Before to do that, an exploratory analysis of the input data to be aggregated is automatically implemented creating: matrix plots, simple statistics reports, correlation matrix, eigenvalues and eigenvectors analysis, scree plots and scores reports. The presence of geographical maps depends on input data type. If there are more than one time period in the data, time series of the composite indices values are evaluated. In the case that more than one aggregation method is selected, comparisons like cograduation's matrix and scatter plots are evaluated too. If desired, is possible to carry out the influence analysis to explore the robustness of the various methods selected. This last one is accomplished by picking out a variable, each at a time, in a loop and evaluating the shifts between the rank based on the remaining variables with that obtained by using the complete set of variables. Mean and standard deviation of the shifts distribution are calculated. Bar plots and reports are produced. Many outputs are saved during the software execution. In order to ease navigation throughout the plots and reports a HTML table of contents is automatically created by COMIC and saved in the output directory.

Results: Simple but user friendly graphical interfaces allow the user to set up execution parameters, choose which composite indices to evaluate. COMIC is entirely written in SAS language using its macro and IML facilities comprised in its base installation.

Main references

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