

Testing differences between projected mortality indicators

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Abstract

The parametric model introduced by Lee and Carter in 1992 for projecting mortality rates in the US was a seminal development and has been widely used since then. Different versions of the model, incorporating hypotheses about the data, constraints on the parameters, and different fitting methods have led to improvements.

We evaluated the extent to which the increments in the complexity and computational cost of the models are reflected in the forecasts of different mortality indicators, by considering three different Lee-Carter models. The nine sets of predictions obtained crossing the three models and the residuals of the original fitting were compared using a mixture of block-bootstrap techniques and functional data analysis contrasts.

Models and methods were applied to Spanish mortality data. Results showed that there is a model effect and interaction for mortality indicators, but there is only a residuals effect for the Gini Index which is a measure of mortality dispersion. Hence, it follows that the most sensitive indicator is the Gini index as it reflects changes in mortality dispersion, especially at advanced ages.

Keywords: mortality indicators, block-bootstrap, functional data analysis.