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A study of age, period and cohort effects applied to Swedish mortality rates

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Abstract

Preceding studies demonstrate that the inclusion of cohort specific effects could improve the fit of stochastic mortality models. To determine the potential improvements, the aim of this study was to quantitatively compare the Lee Carter (LC) and Renshaw Haberman (RH) mortality models explaining the development in mortality rates in Sweden and the United Kingdom. An exploratory analysis was conducted to detect cohort effects while the robustness, interpretability and prediction accuracy was evaluated by periodic model fittings and projections. Ultimately, the fitting of the RH model decreased the occurrence of cross-year and cross-age correlations hence a part of the systematic effects in mortality data can be explained by including a cohort term. However, in contrast to the robust LC model, the RH model proved sensitive to outliers and changes in the underlying data. Although the mortality projections by the RH model improved in terms of forecast accuracy, the lack of robustness in the RH model emphasise that we can not completely rely on the predictions.

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