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A Cohort and Empirical Based Multivariate Mortality Model

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Abstract : This article proposes a cohort-age-period (CAP) model to characterize multi-population mortality processes using cohort, age, and period variables. Distinct from the factor-based Lee-Carter-type decomposition mortality model, this approach is empirically based and includes the age, period, and cohort variables into the equation system. The model not only provides a fruitful intuition for explaining multivariate mortality change rates but also has a better performance in forecasting future patterns. Using the US and the UK mortality data and performing ten-year out-of-sample tests, our approach shows smaller mean square errors in both countries compared to the models in the literature.

Keywords : longevity risk, stochastic mortality model, multivariate mortality rate, risk management
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