

Forecasting Age Distribution of Deaths: A Tale of Transformation

Abstract

Like density functions, period life-table death counts are nonnegative and have a constrained integral, and thus live in a constrained nonlinear space. Implementing established modelling and forecasting methods without obeying these constraints can be problematic for such nonlinear data. Professor Hanlin Shang considers centre log-ratio transformation, alpha-transformation and cumulative distribution function transformation to forecast the life-table death counts. Using the life-table death counts obtained from the Australian, Japanese and US Mortality Databases, Professor Shang evaluates and compares the forecast accuracy among different transformations. The improved forecast accuracy of life-table death counts is of great interest to demographers for estimating age-specific survival probabilities and life expectancy and actuaries for determining temporary annuity prices for different ages and maturities.