MORTALITY FORECAST: GLOBAL OR LOCAL?

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ABSTRACT. Accurate future mortality forecasts are of fundamental importance as they ensure adequate pricing of mortality-linked insurance and financial products. Extrapolative methods are the most commonly adopted forecasting approach in the literature to projecting future mortality rates (see for example Clayton and Schifflers, 1987; Lee and Carter, 1992). These methods tend to identify the trends in past mortality experience and then uses these trends to forecast future mortality rates. There are generally two types of mortality models using the extrapolative approach. The first imposes assumptions on the age, time or cohort structure of the mortality data in either a deterministic fashion (see for example Perks, 1932; Heligman and Pollard, 1980) or a stochastic fashion (see for example Lee and Carter, 1992; Plat, 2009). The second uses non-parametric smoothing method to model mortality and thus has no explicit constraints placed on the model (see for example Currie, $et\ al.$, 2004; Hyndman and Ullah, 2007). We argue that the main difference between the two types of models in terms of forecasting is the fact that, the former uses global information and the latter mainly uses local information. In this paper we conduct an investigation on the comparison of the forecasting performance of the two types of models using mortality data from a range of developed countries. The paper will assess the accuracy of forecasts not only based on statistical measures but also take the randomness of residuals into account. We also explore the possibility of combining the two types of forecasts together to see if this could improve the overall predictive accuracy and reduce the uncertainty of forecasts. Thus a new forecasting approach to future mortality projection will be introduced.

Keywords and Phrases: Mortality, Stochastic models, Non-parametric, Forecasting.

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