

Title: Beyond Whitaker-Henderson: Generalized Additive Models and Mortality Modeling

Philip Adams, North American Biometrics Risk Management unit of Munich Re

Abstract: For over a century, life insurance actuaries have applied Whitaker-Henderson graduation to the construction of mortality tables suitable for valuing life insurance risks. Property and casualty actuaries have met with great success in applying generalized linear models (GLMs) to ratemaking and reserving. However, life practitioners have struggled to adapt GLMs to mortality modeling. Barriers to applying GLMs include inadequate data, inherent non-linearity of some of the covariates influencing mortality, and the relative obscurity of alternatives to traditional approaches. Generalized additive models (GAMs) extend GLMs through the use of automated fitting of non-linear effects. In this presentation, we will demonstrate the advantages of GAMs over traditional and GLM approaches and present views of the Individual Life Experience Committee's 2002-2004 dataset composed using these approaches.