On the decomposition of life expectancy and limits to life

Life expectancy is a measure of how long people are expected to live and is widely used as a measure of human development. Variations in life expectancy reflect not only the process of ageing but also the impacts of epidemics, wars, economic recessions, etc. Since 1950, the influence of these events in the most developed countries has waned and life expectancy continues to grow unabated. As a result, it has become more difficult to forecast long run trends accurately or identify possible upper limits to life expectancy. This uncertainty impacts greatly on the pensions industry and capital markets and ultimately affects the pricing and valuation of annuities. In this paper we will present new methods for comparing past advancements in life expectancy and also future prospects using data from five developed, low mortality countries. We consider life expectancy in ten-year age intervals rather than over remaining life and show how natural ceilings in life expectancy can be used for extrapolating future trends using a logistic model. We conclude by discussing the significance of our results and compare our approach with other commonly used methods and projections.

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