

# A regression based approach for valuing longevity measures

Anna Rita Bacinello <sup>\*1</sup>, Pietro Millossovich <sup>†1,2</sup>, and Fabio Viviano <sup>‡3</sup>

<sup>1</sup>Department of Business, Economics, Mathematics and Statistics ‘B. de Finetti’,  
University of Trieste, Italy.

<sup>2</sup>Faculty of Actuarial Science and Insurance, Bayes Business School, City,  
University of London, UK.

<sup>3</sup>Department of Economics and Statistics, – University of Udine, Italy.

## Abstract

Mortality improvements, as registered in the last decades, have posed a relevant issue among policy makers. The implicit increase in individual’s life expectancy has led governments as well as pension funds and insurance companies to undertake specific studies in order to quantify and manage the related risks. The reasons behind this persistent improvement in mortality are manifold; indeed, the gain in longevity is the result of a complex array of changes in many factors, such as the increasingly advanced technologies and medical progress, economical and cultural conditions, political actions aimed at improving life, to name just a few. Therefore, studying the evolution of mortality and/or the cost of longevity risk is still a prominent task both for demographers and for actuaries. In contrast to the usual period-based evaluation of longevity measures, we address the problem of approximating the distribution of future life expectancy and lifespan disparity with a cohort-based perspective. In particular, we suggest an application of a well-established methodology, i.e. the Least-Squares Monte Carlo approach, which allows to overcome a straightforward nested simulations method by approximating the involved conditional expectations through a linear combination of some basis functions of the relevant risk factors. Furthermore, single and multi-population mortality models are compared, as well as cohort and period-based valuations, in order to assess their effects in evaluating longevity measures

**Keywords:** Longevity risk; life expectancy; lifespan disparity; least square Monte Carlo; multipopulation mortality models.

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\*E-mail address: [bacinel@units.it](mailto:bacinel@units.it)

†E-mail address: [pietro.millossovich.1@city.ac.uk](mailto:pietro.millossovich.1@city.ac.uk)

‡E-mail address: [viviano.fabio@spes.uniud.it](mailto:viviano.fabio@spes.uniud.it)