Solveny appraisal for life annuities: demographic risk measures
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The demographic risk is the risk due to the uncertainty in the demographic scenario assumptions by which life
insurance products are designed and valued. The uncertainty lies both in accidental and systematic deviations of
the number of deaths from the value anticipated for it. This last component gives rise to the risk due to the
randomness in the choice of the survival models for valuations (model risk or projection risk). If the insurance
risk component can be assumed negligible for well-diversified portfolios, longevity risk is crucial in actuarial
valuations. The paper focuses in particular the solvency appraisal for a portfolio of life annuities, deepening the
impact of the demographic risk according to suitable risk indexes apt to describe its evolution in time. The
financial quantity proposed for representing the economic wealth of the life insurance company is the stochastic
surplus and the paper analyzes the impact on it of different demographic assumptions by means of risk indicators
as the projection risk index, the quantile surplus and the ruin probability. The longevity risk is mainly taken into
account in a stochastic scenario for the financial risk component. Numerical applications clarify the practical
meaning of the models in the solvency context.

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