A unisex stochastic mortality model

to comply with EU Gender Directive

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Extended abstract

European Union Gender Directive ruled out discrimination against gender in charging premium for insurance products. This prohibition prevents the use of the usual actuarial fairness principle at policy level used to price life insurance products, with an evident negative effect on pricing efficiency. According to current actuarial practice, unisex prices are calculated with a simple weighting rule that uses the quotes of insurance portfolio as weights. This mixing procedure does not seem to be based on any unisex mortality model. In this paper we fill in this gap and suggest the unisex mortality model on which the unisex tariff is based. The unisex mortality process is a mix of the males' and females' specific mortalities. We find that the weighting coefficient between the males' and females' specific mortalities depends mainly on the quote of portfolio relative to each gender, the age, the type of insurance product, the duration of the policy and the correlation among the two mortality intensities.

The knowledge of the unisex mortality process underlying the mixed portfolio should help the insurers in many tasks, including (i) forecasts of future cash flows of the portfolio, (ii) calculation of the variance and higher moments of the present value of future liabilities, (iii) calculation of the safety
loading, (vi) calculation of the stochastic mathematical reserve, (v) performance of profit testing techniques etc.. The unisex mortality model provides a picture of the dynamics of the mixed portfolio that insurers must price, and should facilitate accurate pricing, improving the companies’ competitiveness.

**Keywords** Actuarial fairness; unisex tariff; doubly stochastic process; Gender Directive.

**References**
