

Solvency requirement in a unisex stochastic mortality model

An Chen ^{*} Montserrat Guillen [†] Elena Vigna [‡]

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Abstract

Following the EU Gender Directive, that obliges insurance companies to charge the same premium to policyholders of different genders, we address the issue of calculating solvency capital requirements (SCRs) for pure endowments and annuities issued to mixed portfolios. The main theoretical result is that, if the unisex fairness principle is adopted for the unisex premium, the SCR calculated at issuing time assuming unisex survivorship is greater than the weighted average of the gender-based SCRs. Numerical results show that for pure endowments the gap between the two is negligible, but for lifetime annuity the gap can be as high as 3-4%. We also analyze some conservative pricing procedures that deviate from the unisex fairness principle, and find that they lead to SCRs that are lower than the weighted average of the gender-based SCRs, because the policyholders are overcharged at issuing time.

Keywords. SCR, life insurance pricing, unisex tariff, unisex fairness principle, life table, risk margin, Gender Directive.

JEL codes. C1, C13, C18, C38, J11

^{*}University of Ulm, Germany. E-Mail: an.chen@uni-ulm.de.

[†]University of Barcelona, Spain. E-Mail: mguillen@ub.edu.

[‡]University of Torino, Collegio Carlo Alberto and CeRP, Italy. E-Mail: elena.vigna@unito.it.