

Fair Valuation of Life Insurance Liabilities: Integrating Demographic and Market Risk

Anna Rita Bacinello* An Chen† Pietro Millossovich‡

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Abstract

The aim of this paper is to assess the joint impact of demographic and financial risk on the market valuation of life insurance liabilities. The model builds on the contingent claim approach pioneered by [2] and later extended by [4, 1]. In particular, we analyze the extent to which the solvency of an insurance company is affected by various kinds of guarantees offered to policyholders.

Keywords: *Default Risk, Demographic Risk, Fair Value, Life Insurance Liabilities*

References

- [1] Bernard, C., Le Courtois, O., Quittard-Pinon, F., (2005). Market value of life insurance contracts under stochastic interest rates and default risk. *Insurance: Mathematics and Economics* 36, 499–516.
- [2] Briys, E., de Varenne, F., 1994. Life insurance in a contingent claim framework: pricing and regulatory implications. *Geneva Papers on Risk and Insurance Theory* 19(1), 53–72.
- [3] Chen, A., Suchanecski, M., 2007. Default Risk, Bankruptcy Procedures and the Market Value of Life Insurance Liabilities. *Insurance: Mathematics and Economics* 40(2), 231–255.

*Dipartimento di Matematica Applicata ‘B. de Finetti’, Faculty of Economics – University of Trieste, Piazzale Europa 1, 34100 Trieste, Italy, Phone: +39-040-5587110, Fax: +39-040-54209, E-mail: bacinel@units.it

†Netspar and Department of Quantitative Economics, University of Amsterdam, Roetersstraat 11, 1018 WB Amsterdam, The Netherlands, Phone: +31-20-5254125, Fax: +31-20-5254349, E-mail: A.Chen@uva.nl

‡Dipartimento di Matematica Applicata ‘B. de Finetti’, Faculty of Economics – University of Trieste, Piazzale Europa 1, 34100 Trieste, Italy, Phone: +30-040-5587068, Fax: +39-040-54209, E-mail: pietrom@econ.units.it

- [4] Grosen, A., Jørgensen, L., 2002. Life insurance liabilities at market value: an analysis of insolvency risk, bonus policy, and regulatory intervention rules in a barrier option framework. *Journal of Risk and Insurance* 69(1), 63–91.