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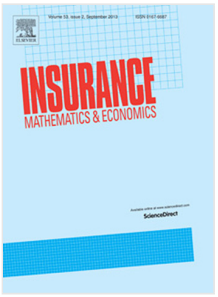

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Vincenzo Russo, Rosella Giacometti, Frank J. Fabozzi

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Intensity-Based Framework for Surrender Modeling In Life Insurance

Vincenzo Russo[1]
Rosella Giacometti[2]
Frank J. Fabozzi[3]

Abstract

In this paper, we propose an intensity-based framework for surrender modeling. We model the surrender decision under the assumption of stochastic intensity and use, for comparative purposes, the affine models of Vasicek and Cox-Ingersoll-Ross for deriving closed-form solutions of the policyholder's probability of surrendering the policy. The introduction of a closed form solution is an innovative aspect of the model we propose. We evaluate the impact of dynamic policyholders' behavior modeling the dependence between interest rates and surrendering (affine dependence) with the assumption that mortality rates are independent of interest rates and surrendering. Finally, using experience-based decrement tables for both surrendering and mortality, we explain the calibration procedure for deriving our model's parameters and report numerical results in terms of best estimate of liabilities for life insurance under Solvency II.

Keyword: Life insurance, Surrender option, Intensity-based models, Vasicek, CIR, best estimate of liabilities (BEL).

JEL classification: C02, C60, G22, G32.

[1] Head of Unit - Group Risk Management at Generali, Milan, Italy. russovincent@gmail.com
[2] Department of Management, Economics and Quantitative Methods, University of Bergamo, Bergamo, Italy. rosella.giacometti@unibg.it
[3] EDHEC Business School in Nice, France. frank.fabozzi@edhec.edu