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One-Year Non-Life Solvency II Risk Calculations for Point Process Micro Models: Methods and Applications

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Abstract

The present paper describe how one-year non-life insurance risks according to the Solvency II directive may be calculated consistently for a class of point process based micro reserving models introduced by Norberg (1993). The suggested approach is based on nested simulations. Apart from showing that the simulation based approach is practically feasible, the underlying model is assessed both w.r.t. in-sample and out-of-sample performance, together with an analysis of the simulation error. The methods are applied to real non-life insurance data and the results are put in relation to Solvency II standard formula calculations.

Keywords: Claims reserving, point processes, nested simulations, claims development result, one-year risks

1 Introduction

The current paper is concerned with the calculation of one-year non-life insurance risks as defined by the Solvency II directive with a main focus on the claims reserve risk. This will be done following the marked Poisson process approach introduced in [32]. In [32] the focus is on the theoretical framework describing how to model outstanding claims costs for Reported But Not Settled (RBNS) claims, but also Incurred But Not Reported (IBNR) claims and Not Incurred (NI) claims (actually "covered" and not incurred). The latter claim type corresponds to future not incurred claims stemming from covered contracts, which is closely connected to the Solvency II premium risk which corresponds to future claims from existing contracts as well as to contracts expected to be written over the following 12 months, see [9, Article 105(2)]. The idea of [32] is to

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