Valuation of non-life liabilities from claims triangles

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Abstract

This paper provides a complete program for valuation of aggregate non-life insurance liability cash flows based on claims triangle data. The valuation is fully consistent with the principle of valuation by considering the costs associated with a transfer of the liability to a so-called reference undertaking subject to capital requirements throughout the runoff of the liability cash flow. The valuation program includes complete details on parameter estimation, bias correction and conservative estimation of the value of the liability under partial information. The latter is based on a new approach to estimation of mean squared error of claims reserve prediction.

1 Introduction

The purpose of the present paper is to describe how the cost-of-capital approach from [6], which builds on the approach to market-consistent liability valuation from [15], may be implemented using non-life claims triangle data covering both premium and reserve risk. In [6], general formulas for cost-of-capital valuation of liability cash flows are provided. For this to become practically relevant in a non-life insurance context we need to define cash flow dynamics which are consistent with those seen in actual non-life insurance applications.

The undoubtedly most common claims triangle reserving method used in practice is the (distribution-free) Chain-Ladder method defined in [12]. This is a pure reserving method and there is from that perspective no need to define how the model is initiated, since reserving amounts to estimating outstanding costs for already incurred claims. This is in contrast to premium risk where there is a need to describe how not yet incurred claims will generate future payments. Further, the pan-European insurance regulation Solvency II is constructed to measure, amongst other things, non-life