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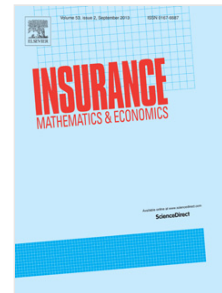
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A survey of personalized treatment models for pricing strategies in insurance

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Abstract

We consider a model for price calculations based on three components: a fair premium; price loadings reflecting general expenses and solvency requirements; and profit. The first two components are typically evaluated on a yearly basis, while the third is viewed from a longer perspective. When considering the value of customers over a period of several years, and examining policy renewals and cross-selling in relation to price adjustments, many insurers may prefer to reduce their short-term benefits so as to focus on their most profitable customers and the long-term value. We show how models of personalized treatment learning can be used to select the policy holders that should be targeted in a company's marketing strategies. An empirical application of the causal conditional inference tree method illustrates how best to implement a personalized cross-sell marketing campaign in this framework.

Keywords: rate making, cross-selling in insurance, predictive models, causal inference

1. Introduction

Actuarial science in nonlife insurance deals with the problem of pricing by calculating the fair premium each customer should pay for an insurance contract. Nevertheless, the final price offered to the customer is also markedly influenced by the specific conditions prevailing in the insurance market and by each company's commercial strategy over time. Examples of such strategies can be readily consulted in the literature: for example, [De Kok \(2003\)](#) argues that a company offering a

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