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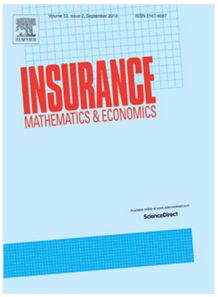

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Continuity inequalities for multidimensional renewal risk models

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Abstract

In this paper we study the continuity properties of the surplus process in multidimensional renewal risk models. Under certain conditions on the distributions of claim sizes and inter-claim times we prove continuity (stability) inequalities expressed in terms of the total variation distance between the processes. The usage of the uniform metric is also discussed.

JEL Codes: C3; G22.

Keywords: Multidimensional renewal risk model, continuity inequalities for surplus process, probability metrics, total variation distance.

1 Model and the problem of continuity estimation

Although multidimensional risk models have been studied for several decades, they have recently attracted a growing interest. In particular, bivariate risk processes with common renewal claim arrival processes, model several stochastically dependent lines in the insurance business, when accidents cause claims of different types, such as, vehicle damages and personal injuries. (See, for instance, Badila et al. (2015), Cai and Li (2005, 2007), Chan et al. (2003), Chen et al. (2011), Cojocaru (2015), Hu and Jiang (2013), Huang et al. (2014), Ivanovs and Boxma (2015) and Li et al. (2007).)

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