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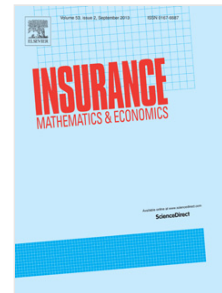
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ANNUAL INTRINSIC VALUE OF A COMPANY IN A COMPETITIVE INSURANCE MARKET

Vsevolod K. Malinovskii

ABSTRACT. In this paper we analyze a measure of the insurance company's value in an extended Lundberg model which includes the effect of competition on pricing. The extended model is designed to be an integral part of a multi-year controlled risk model of a company operating on both competitive insurance and financial markets, when insureds migrate in seeking for better rates and investors migrate in seeking for higher return on investments.

1. Introduction and rationale

Filip Lundberg introduced his model in 1903. He sought to investigate the property and liability insurance business of a firm during a period of, say, one year regarding the total risk business as an economic system developing in time, and in every instant subject to random fluctuations¹. With Lundberg's approach², "it is no longer necessary to consider each contract in the portfolio in order to determine the probability distribution of the total amount of claim payments. Instead, this distribution is built up from . . . two distributions which it should be possible to estimate from the records of the company."

On the one hand³, "this approximation of the reality . . . led to very remarkable results. A great part of these results, particularly with regard to the ruin theory, should have been very difficult to reach, if more realistic models had been introduced from the beginning." On the other hand⁴, "from a practical point of view, the theory of collective risk, as initiated by Filip Lundberg, has missed the point, because the underlying model is unrealistic, too simplified. For one thing, a stationary business should give stationary

Key words and phrases. Lundberg risk model, Price competition, Migration of insureds, Annual insurer's intrinsic value, Insurer's solvency, Asymptotic bounds.

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¹In fact, we have quoted Cramér (1976) who digested Lundberg's contribution as follows: "The net result of the risk business of an insurance company during a period of, say, one year, could be regarded as the sum of the net results of all the individual insurances. If these were supposed to be mutually independent, the connection with the classical "central limit theorem" in probability theory was evident. But there was also the possibility of regarding the total risk business as an economic system developing in time, and in every instant subject to random fluctuations. Systems of this kind had been considered in some pioneering works which today appear as forerunners of the modern theory of stochastic processes."

²We quote further in this sentence Borch (1967), p. 439.

³We quote further in this sentence Philipson (1968), p. 49.

⁴Further on, we quote H. Bohman' farewell interview as retiring Chief Editor of the Scandinavian Actuarial Journal, see Bohman (1987), p. 2. It was given at the end of his distinguished career as a member of the Swedish Probability School and, which makes it more valuable, as an experienced person from the industry.

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