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A proof of a conjecture in the Cramér-Lundberg model with investments

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(Submitted on 27 Feb 2010)

In this paper, we discuss the Cram\'er-Lundberg model with investments, where the price of the invested risk asset follows a geometric Brownian motion with drift a and volatility $\sigma> 0.$ By assuming there is a cap on the claim sizes, we prove that the probability of ruin has at least an algebraic decay rate if $2a/\sigma^2 > 1$. More importantly, without this assumption, we show that the probability of ruin is certain for all initial capital u, if $2a/\sigma^2 \le 1$.

Subjects:	**Probability (math.PR)**; Risk Management (q-fin.RM)
MSC classes:	60J70; 91B30
Cite as:	**arXiv:1003.0135v1 [math.PR]**

Submission history

From: Wei-Shih Yang [view email]
[v1] Sat, 27 Feb 2010 22:02:02 GMT (8kb)

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