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A Lévy insurance risk process with tax. (English) Zbl 1144.60032
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Summary: Using fluctuation theory, we solve the two-sided exit problem and identify the ruin probability for a general spectrally negative Lévy risk process with tax payments of a loss-carry-forward type. We study arbitrary moments of the discounted total amount of tax payments and determine the surplus level to start taxation which maximises the expected discounted aggregate income for the tax authority in this model. The results considerably generalise those for the Cramér-Lundberg risk model with tax.

MSC:

60G51 Processes with independent increments; Lévy processes
91B30 Risk theory, insurance (MSC2010)
60J75 Jump processes (MSC2010)

Cited in **3** Reviews
Cited in **37** Documents

Keywords:

Lévy process; fluctuation theory; excursion theory; scale functions; insurance risk theory; ruin probability; tax payments

Full Text: [DOI](#)

References:

- [1] Albrecher, H. and Hipp, C. (2007). Lundberg's risk process with tax. *Blätter der DGVMF* 28 , 13–28. · [Zbl 1119.62103](#) · [doi:10.1007/s11857-007-0004-4](#)
- [2] Avram, F., Palmowski, Z. and Pistorius, M. R. (2007). On the optimal dividend problem for a spectrally negative Lévy process. *Ann. Appl. Prob.* 17 , 156–180. · [Zbl 1136.60032](#) · [doi:10.1214/105051606000000709](#) ·
- [3] Bertoin, J. (1996). *Lévy Processes*. Cambridge University Press. · [Zbl 0861.60003](#)
- [4] Bertoin, J. (1997). Exponential decay and ergodicity of completely asymmetric Lévy processes in a finite interval. *Ann. Appl. Prob.* 7 , 156–169. · [Zbl 0880.60077](#) · [doi:10.1214/aoap/1034625257](#) ·
- [5] Chan, T. and Kyprianou, A. E. (2008). Smoothness of scale functions for spectrally negative Lévy processes. Submitted. · [Zbl 1259.60050](#)
- [6] Chiu, S. N. and Yin, C. (2005). Passage times for a spectrally negative Lévy process with applications to risk theory. *Bernoulli* 11 , 511–522. · [Zbl 1076.60038](#) · [doi:10.3150/bj/1120591186](#) ·
- [7] Doney, R. A. (2005). Some excursion calculations for spectrally one-sided Lévy processes. In *Séminaire de Probabilités XXXVIII*, (Lecture Notes Math. 1857), Springer, Berlin, pp. 5–15. · [Zbl 1068.60073](#) · [doi:10.1007/b104072](#)
- [8] Furrer, H. (1998). Risk processes perturbed by α -stable Lévy motion. *Scand. Actuarial J.* 1 , 59–74. · [Zbl 1026.60516](#) · [doi:10.1080/03461238.1998.10413992](#)
- [9] Garrido, J. and Morales, M. (2006). On the expected discounted penalty function for Lévy risk processes. *N. Amer. Actuarial J.* 10 , 196–218.
- [10] Gerber, H. U. and Shiu, E. S. W. (2004). Optimal dividends: analysis with Brownian motion. *N. Amer. Actuarial J.* 8 , 1–20. · [Zbl 1085.62122](#)
- [11] Huzak, M., Perman, M., Šikić, H. and Vondraček, Z. (2004). Ruin probabilities and decompositions for general perturbed risk processes. *Ann. Appl. Prob.* 14 , 1378–1397. · [Zbl 1061.60075](#) · [doi:10.1214/105051604000000332](#) ·
- [12] Klüppelberg, C. and Kyprianou, A. E. (2006). On extreme ruinous behaviour of Lévy insurance risk processes. *J. Appl. Prob.* 43 , 594–598. · [Zbl 1118.60071](#) · [doi:10.1239/jap/1152413744](#) ·
- [13] Klüppelberg, C., Kyprianou, A. E. and Maller, R. A. (2004). Ruin probabilities and overshoots for general Lévy insurance risk processes. *Ann. Appl. Prob.* 14 , 1766–1801. · [Zbl 1066.60049](#) · [doi:10.1214/105051604000000927](#) · [euclid:aoap/1099674077](#)
- [14] Kyprianou, A. E. (2006). *Introductory Lectures on Fluctuations of Lévy Processes with Applications*. Springer, Berlin. · [Zbl 1104.60001](#)
- [15] Kyprianou, A. E. and Palmowski, Z. (2007). Distributional study of de Finetti's dividend problem for a general Lévy insurance risk process. *J. Appl. Prob.* 44 , 428–443. · [Zbl 1137.60047](#) · [doi:10.1239/jap/1183667412](#) ·
- [16] Loeffen, R. (2008). On optimality of the barrier strategy in de Finetti's dividend problem for spectrally negative Lévy processes. To appear in *Ann. Appl. Prob.* · [Zbl 1152.60344](#)

- [17] Renaud, J.-F. and Zhou, X. (2007). Distribution of the present value of dividend payments in a Lévy risk model. *J. Appl. Prob.* 44 , 420–427. · [Zbl 1132.60041](#) · [doi:10.1239/jap/1183667411](#) ·
- [18] Yang, H. and Zhang, L. (2001). Spectrally negative Lévy processes with applications in risk theory. *Adv. Appl. Prob.* 33 , 281–291. · [Zbl 0978.60104](#) · [doi:10.1239/aap/999187908](#) ·
- [19] Zhou, X. (2006). Discussion on: On optimal dividend strategies in the compound Poisson model, by H. Gerber and E. Shiu (*N. Amer. Actuar. J.* 10 , 76–93). *N. Amer. Actuarial J.* 10 , 79–84.
- [20] Zhou, X. (2007). Exit problems for spectrally negative Lévy processes reflected at either the supremum or the infimum. *J. Appl. Prob.* 44 , 1012–1030. · [Zbl 1132.60042](#) · [doi:10.1239/jap/1197908821](#) · [euclid:jap/1197908821](#)

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