

# Exit and ruin times for general renewal risk-models

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## SUMMARY

When the classical Lundberg-Cramer model of risk theory is generalized to have arbitrary i.i.d. holding times (cf. [1],[2]) those results derived at jump times will not carry over to arbitrary present due to the lack of Markoviannes. In particular exit times depend on the actual state and available information. Here we consider mean ruin times assuming that the present is not necessarily a jump instant, and also a partial knowledge from the observer. We show how the solution to this problem involves ideas drawn from renewal theory. It is found that key properties of a companion integral equation depend on the relative sign of drift and jumps. If this ratio is positive the solution can be given in closed form. For the opposite-sign case we analyze a family of solvable cases. The results may be relevant to predict the mean time for an insurance company to go bankrupt when the information regarding the company's past performance has not been disclosed and only the actual company budget is available.

**Keywords:** risk theory, mean ruin times

**AMS Classification:** 91B30, 60K15, 60J75

## References

- [1] S. LI AND J. GARRIDO(2004). On ruin for the Erlang(n) risk process. *Insur. Math. Econ.* **volume**(34), 391-408.
- [2] D. C. M. DICKSON (1998). On a class of renewal risk process. *North Am. Act. J.* **volume**(2), 60-68.

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