On optimal periodic dividends under fixed transaction costs for spectrally one-sided Lévy processes

Benjamin Avanzi [*1,2], Hayden Lau [†1], and Bernard Wong [‡1]

[1]School of Risk and Actuarial Studies, UNSW Australia Business School, UNSW Sydney NSW 2052, Australia
[2]Département de Mathématiques et de Statistique, Université de Montréal , Montréal QC H3T 1J4, Canada

Abstract

Maximizing dividends is one classical stability criterion in actuarial risk theory. Motivated by the fact that dividend are paid periodically in real life, *periodic* dividend strategies were introduced recently. In this paper, we incorporate fixed transaction costs into the model and study the optimal periodic dividend strategy with fixed transaction costs for spectrally one-sided Lévy processes.

For spectrally positive Lévy processes, we derive the value function of a periodic (b_u, b_l) strategy in terms of scale functions. Such a strategy leads to lump sum dividends that bring the surplus back to b_l as soon as it becomes no less than b_u (because of diffusion or jumps). Conditions for optimality are provided.

For spectrally negative Lévy processes, the value function of a periodic (b_u, b_l) strategy is calculated by means of exiting identities and Itô's excusion, if necessary. We show that a sufficient condition for optimality is that Lévy measure admits a density which is completely monotonic. Under such assumptions, the approach used for the spectrally positive case can be carried over to the spectrally negative case. The periodic (b_u, b_l) strategy (with properly chosen parameters) is confirmed to be optimal.

Results are illustrated.

Keywords: Optimal periodic dividends; SPLP; SNLP; Fixed transaction costs

[*]E-mail address: b.avanzi@unsw.edu.au
[†]E-mail address: kawai.lau@unsw.edu.au
[‡]E-mail address: bernard.wong@unsw.edu.au