

Yang, H. (2014). Geometric Stopping of a Random Walk and Its Applications to Valuing Equity-linked Death Benefits, The 5th International Gerber-Shiu Workshop: In honor of Professor Elias S. W. Shiu on the occasion of his 65th birthday, Hong Kong, July 2014.

Abstract:

We study discrete-time models in which death benefits can depend on a stock price index, the logarithm of which is modeled as a random walk. Examples of such benefit payments include put and call options, barrier options, and lookback options. Because the distribution of the curtate-future-lifetime can be approximated by a linear combination of geometric distributions, it suffices to consider curtate-future-lifetimes with a geometric distribution. In binomial and trinomial tree models, closed-form expressions for the expectations of the discounted benefit payment are obtained for a series of options. They are based on results concerning geometric stopping of a random walk, in particular also on a version of the Wiener-Hopf factorization. (This is a joint paper with Hans U. Gerber and Elias S.W. Shiu).