Dividend Maximization in the Cramer-Lundberg Model using Homotopy Analysis Method

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Abstract
Problem statement: We used the Homotopy Analysis Method (HAM) to numerically compute the value function of the dividend payment in the basic insurance process. Approach: The process is a constant income stream from premiums which is subtracted a claim process of the Poisson type. Further, an allowance for payment of dividends to shareholders was incorporated. Results: The case when the claims are exponential has an analytical solution. The HAM was then applied to the resulting Hamilton-Jacobi-Bellman equation and the numerical results obtained were compared to the theoretical results in order to check the validity of the method. Conclusion: The HAM was then applied to the model to check for other claim size distributions. The results obtained are very encouraging.