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Yumin Wang* (wangyumin@ums1.edu), St Louis, MO 63121, and **Zuo Jin** and **George Yin**.

Numerical solutions of quantile hedging for guaranteed minimum death benefits under a regime-switching jump-diffusion formulation.

This work develops numerical approximation methods for quantile hedging involving mortality components for contingent claims in incomplete markets, in which guaranteed minimum death benefits (GMDBs) could not be perfectly hedged. A regime-switching jump-diffusion model is used to delineate the dynamic system and the hedging function for GMDBs, where the switching is represented by a continuous-time Markov chain. Using Markov chain approximation techniques, a discrete-time controlled Markov chain with two component is constructed. Under simple conditions, the convergence of the approximation to the value function is established. Examples of quantile hedging model for guaranteed minimum death benefits under linear jumps and general jumps are also presented. (Received September 22, 2011)