STOCHASTIC MORTALITY, MACROECONOMIC RISKS, AND LIFE INSURER SOLVENCY

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Abstract

Motivated by a recent demographic study establishing a link between macroeconomic fluctuations and the mortality index *kt* in the Lee-Carter model, we assess the impact of macroeconomic fluctuations on the solvency of a life insurance company. Liabilities in our stochastic simulation framework are driven by a GDP-linked variant of the Lee-Carter mortality model. Furthermore, interest rates and stock prices react to changes in GDP, which itself is modeled as a stochastic process. Our results show that insolvency probabilities are significantly higher when the reaction of mortality rates to changes in GDP is incorporated.

Keywords: Life insurance, asset-liability management, stochastic mortality, Lee-Carter model, business cycle