Risk and Valuation of Mortality Contingent Catastrophe Bonds

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Abstract

Catastrophe Mortality Bonds are a recent capital market innovation providing insurers and reinsurers with the possibility to transfer catastrophe mortality risk off their balance sheets to capital markets. This article introduces a time-continuous model for analyzing and pricing catastrophe mortality contingent claims based on stochastic modeling of the force of mortality. In addition, we give an concise survey of past transactions and explain in detail the structure of the deals and the securities. Parametrizations of the proposed model based on three different calibration procedures are derived. The resulting loss profiles and prices are compared to loss profiles provided by the issuers and to market prices, respectively. We find that the profiles are subject to great uncertainties and should hence be considered with care by investors and rating agencies. Furthermore, by comparing outcomes of risk-adjusted parametrizations based on insurance quotes and parametrizations implied by market prices, we are able to give a possible explanation for the relatively fast growth of the market for Catastrophe Mortality Bonds over the last years.

JEL classification: G12; G20; C60

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