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Investors' Perspective Risk Analysis of Catastrophe Bonds

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Catastrophe bonds were introduced in the mid 1990's in order to securitize low frequency high severity events in a bond-like structure. In his 1997 chairman's letter, Warren Buffett wrote that catastrophe bonds "may well live up to their name". Based on Buffett's quote, it is the objective of this paper to summarize and analyze the risks catastrophe bond investors are exposed to and have to be aware of. In order to achieve that, the cash flow patterns of catastrophe bonds are decomposed and compared to those within the traditional insurance business. The decomposition shows that catastrophe bond investors are bearing significant amounts of underwriting and investment risk. In this context, the underwriting risk and its consequences for investors is described by the early concepts of several German authors. It is deduced that catastrophe bond holders bear dangerous forms of risks which are deeply connected with underwriting risk. Moreover, the bankruptcy of Lehman Brothers, which was a major swap provider within catastrophe bond transactions, has shown that investing in catastrophe bonds is also connected with several investment risks. Finally, since catastrophe bond investors bear heavy-tailed risks, ruin theory for subexponential claim amount distributions can be applied to model the risk reserve processes of catastrophe bond holders. Thereby, it is concluded that large claim amounts being ruinous for catastrophe bond investors happen spontaneously and "out of the blue". Hence, investors have to understand the risk occurrence structure inherent in catastrophe bonds and invest accordingly, because otherwise, catastrophe bonds may really well live up to their name. (The paper is composed of parts which are taken from the author's forthcoming thesis about the pricing of insurance-linked securities.)