

عنوان مقاله:

Catastrophe Swap Valuation Based on Stochastic Damage and its Numerical Solution

محل انتشار: مجله ریاضیات و مدل سازی در امور مالی, دوره 2, شماره 1 (سال: 1401)

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خلاصه مقاله:

Pricing catastrophe swap as an instrument for insurance companies risk management, has received trivial attention in the previous studies, but in most of them, damage severities caused by the disaster has been considered to be fixed. In this study, through considering jumps for modeling the occurrence of disasters as in Unger [""Y] and completing it through considering damages caused by natural disasters as stochastic, an integro-differential model was extracted to value catastrophe swap contracts. In determining the swap price changes, the Ito command was followed and to achieve the catastrophic swap model, the generalization of the Black and Scholes modeling method was used. ["]. With regard to the initial and boundary conditions, extracted model does not have an analytical solution; thus, its answer was approximated using the finite difference numerical method and the effect of considering the damage as stochastic on swap value was analyzed. In addition, the model and the extracted numerical solution were separately implemented on the data about the earthquake damage in the United States and Iran. The results showed that prices will experience a regular upward trend until damage growth, damage severities, and occurrence probability of a catastrophe are not so high that the buyer of the swap is forced to pay compensation to the swap's seller. Of course, .the prices will fall sharply as soon as they reach and cross the threshold

كلمات كليدى:

Catastrophe Swap, Stochastic Damage, Numerical Solution, Earthquake Damage

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