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Dynamic Hedging of Portfolios of Financial Guarantees Under Jump Diffusion Condition

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Abstract

We develop a theoretical model to describe the real world price dynamics of financial markets and perform Monte Carlo simulation to study the hedging process of portfolios of financial guarantees. Several hedging strategies are developed with the goal of minimizing the portfolios' risks. The strategies' robustness is tested by using a Poisson process to simulate jump risks. Transaction costs are also taken into account. It is shown that the gamma hedging strategy using standard options is the most effective in terms of risk reduction. It is also the most robust strategy with respect to jump risks. If the insured firm assets are not traded or in a high transaction cost environment, the guarantor can use an index-based security as a hedging instrument. During this talk, we present mathematical and computational details of our market model and trading strategies.