RISK ADJUSTED PRICING METHODOLOGY

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This work is based on the risk adjusted pricing methodology introduced by M. Kratka [1]. We study the problem of discrete hedging time. In the case of non-continuous hedging time it is not possible to get a deterministic synthetic portfolio. We introduce a model which involves transaction costs as well as a risk premium which depends on the variance of the synthetic portfolio. We show that in this model an optimal hedging time exists. Furtherwise we clarify the relation between this hedging time and the Gamma function. Finally we obtain the price of the derivative as a solution of a non-linear partial differential equation.

The numeric solution shows that this model is able to explain the convexity of implied volatility (volatility smile) which is a paradox of the Black-Scholes model.

References

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