

Pricing and Hedging of CDO-squared tranches by using a one factor Lévy model

Florence Guillaume*

Philippe Jacobs†

Wim Schoutens‡

Abstract

Copula models have become the market standard for the pricing of CDO tranches. These models present two main advantages: the dependence structure between default times can be specified independently of the marginal credit curves and the pricing rests on a semi-analytical method. These two advantages still hold in the case of CDO-squared tranche pricing. The aim of the first part of this talk consists of an extension of the commonly used Gaussian copula model to the class of Lévy copula models. More particularly, it provides a comparison of the exponential copula Lévy model with the classical Gaussian copula model for the pricing of CDO-squared tranches. Several approximations of the recursive approach are considered: a full Monte Carlo approximation, a multivariate Normal approximation of the joint inner CDO loss distribution firstly proposed by Shelton and a multivariate Poisson approximation of the joint number of defaults affecting the inner CDOs. More particularly, a sensitivity analysis is carried out for three particular days characterised by a low, medium and high value of the quoted iTraxx and CDX index spreads. The second main part of this talk features a comparison of the exponential Lévy and Gaussian Deltas under the multivariate Normal approximation for a period extended from the 20th of September 2007 until the 13rd of February 2008. The Deltas are computed with respect to a weighted and unweighted versions of the CDS pool as well as with respect to another CDO-squared tranche.

*K.U.Leuven, Department of Mathematics, Celestijnenlaan 200 B, B-3001 Leuven, Belgium. E-mail: Florence.Guillaume@wis.kuleuven.be

†KBC, E-mail: philippe.jacobs@kbc.be

‡K.U.Leuven, Department of Mathematics, Celestijnenlaan 200 B, B-3001 Leuven, Belgium. E-mail: Wim.Schoutens@wis.kuleuven.be