Single Name Credit Default Swaptions Meet Single Sided Jump Models

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Abstract: Credit risk modeling is about modeling losses. These losses are typically coming unexpectedly and triggered by shocks. So any process modeling the stochastic nature of losses should reasonable include jumps. In this paper we review a few jump driven models for the valuation of CDSs and show how under these dynamic models also pricing of (exotic) derivatives on single name CDSs is possible. More precisely, we set up fundamental firm-value models that allow for fast pricing of the ‘vanillas’ of the CDS derivative markets: payer and receiver swaptions. It turns out that the proposed model is able to produce realistic implied volatility smiles. Moreover, we detail how a CDS spread simulator can be set up under this framework and illustrate its use for the pricing of exotic derivatives on single name CDSs as underliers.

Keywords: Single sided Lévy processes, First passage probability, Firm’s value model, Credit default swaptions

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